

SINCLAIR

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QL

WORLD

**QL Scene:
Air Message,
Plus Lots More**

QL Bulletin Board

**Trouble shooter:
QXL and SMSQ**

**SuperBasic in Action:
File Requester**

**Triqlhex:
Hair-tearing game**

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Fed up of DIGITAL PRECISION telling you how very good their software is?

✓ "As you might surmise by this time, I am impressed by QMATHS's abilities. Having noted that DIGITAL PRECISION's advertising tends to be loaded with superlatives (incredible, ultimate, superb come to mind), I had approached this evaluation with some scepticism. That scepticism has vanished." > INTERNATIONAL QL REPORT (IQLR, available from Miracle Systems) May/June 1993 issue, Official Review by M.Laverne commissioned by IQLR (who bought their review copy of the program).

✓ "PERFECTION is an exciting, full-flavoured, general purpose word processor of incredible capacity... PERFECTION has now been outshone by the recently released PERFECTION SPECIAL EDITION... The discoveries begin to trip over themselves as PERFECTION SE responded to the keyboard with unexpected speed and intelligence... PERFECTION SE is blindingly fast at most things, and you are never left waiting for it. PERFECTION is everything that Quill never became: easy to use, very flexible, loaded with genuinely useful features, cleanly multi-tasking, capacious and incredibly fast. The SPECIAL EDITION offers 12 cylinder power and luxury to an already impressive package." > SINCLAIR QL WORLD magazine Official Review, April 1993 issue, by THE Mike Lloyd of Keyword Index / New QL User Guide fame.

✓ "I find PROFESSIONAL PUBLISHER an outstandingly good program that really does allow highly professional documents to be produced. For your interest I have included a few samples of work done for school using a combination of PERFECTION, PROFESSIONAL PUBLISHER, QUICKLASER and EYE-Q. You will be pleased to know that the quality has been rated so highly that people do not believe it can really have been done with just a QL... I must stress that I am already highly impressed with, and very satisfied by, the performance of PROFESSIONAL PUBLISHER and all the other DP programs that I use... I seem to learn something new that can be done almost each time I use the program. Very many thanks for helping to keep the QL ahead of the field." > Martin J Neave, Headteacher, Watton County Jnr School, Brandon Rd, Watton, Norfolk, IP25 6AL (unsolicited letter dated 18 May 1993 ordering more programs: Mr Neave had paid full price for everything).

✓ "LIGHTNING SPECIAL EDITION accelerates QL operation as nothing else does... more than 10x is achievable and 2x-4x is typical... I could not fault LIGHTNING SPECIAL EDITION on anything. It is a clear winner and a best buy at £49.95." > SINCLAIR QL WORLD magazine Official Review, April 1990 issue, by Ron Massey, who wrote EDITOR (bought full price) was "Superb" in an earlier review.

✓ "PERFECTION is well named" > R.H.Petford, Kingston Hill, Surrey, KT2 7LJ (unsolicited letter received May 25, 1993: another full price purchaser & upgrader).

✓ "When my ideal program finally arrived in the form of PROFESSIONAL PUBLISHER, it surpassed all my expectations... PROFESSIONAL PUBLISHER (is) in a class of its own, and makes it the only QL desktop publishing program for the very serious user... Until Digital Precision released PROFESSIONAL PUBLISHER, my opinion was that the use I could make of desktop publishing was mainly restricted to short documents... PROFESSIONAL PUBLISHER is a very versatile program... The illustrations for this series of articles have all been produced on PROFESSIONAL PUBLISHER... My printer is a BROTHER 9-pin dot matrix printer. It does illustrate the very high quality that can be obtained from PROFESSIONAL PUBLISHER even when using a simple printer." > SINCLAIR QL WORLD magazine Guide to desktop publishing ("A Question of Dots"), January 1992 to December 1992 issues: the reviewer had bought PROFESSIONAL PUBLISHER, PERFECTION SE, FONT ENLARGER, TOOLBOXES, QUICKLASER etc from Digital Precision all at full price.

✓ "I am aware that over the years Digital Precision has given considerable support to the QL scene but seldom, if ever, can there have been such estimable service as I recently encountered with PERFECTION PLUS." > The Hon. W.D.R. Spens, Bridgewater, Somerset, TA5 1HG, QUANTA magazine, March 1992 issue. Mr Spens has bought a lot of his software from Digital Precision, all at full price of course.

✓ "The Digital Precision Desktop Publisher was rightly hailed as an extraordinary programming achievement when it was released two years ago. Mike Lloyd casts a professional eye over Digital Precision's latest page-making blockbuster (PROFESSIONAL PUBLISHER) and finds plenty to be pleased about... there is unlikely to be a single program of such magnitude and quality (as PROFESSIONAL PUBLISHER) written for the Sinclair QL." > SINCLAIR QL WORLD Official Review, August 1989 issue, by M.Lloyd, who personally bought all this at full price.

✓ "EDITOR is a liberation. After Quill, it was like jumping from an aquarium into the sea. It has become part of my professional life... Everyone is now writing about the excellence of PERFECTION. I have not tried it, not having any perceived need for it (having EDITOR)" > Suzanne Cronje, QUANTA magazine, May 1992 issue, page 2. Ms Cronje naturally had paid the full price for her copy of EDITOR SE etc.

✓ "I have found (PERFECTION) to be simply excellent, fast, packed with features and very well thought out. I can find little to say that will convey just how good this program is, except to quote Digital Precision's own advertising: PERFECTION will blow your socks off. PERFECTION is the program that Quill users have been waiting for." > SINCLAIR QL WORLD's first Official Review, May 1991 issue.

✓ "Digital Precision (DP) decided to begin work on a replacement for Quill which would be very quick, simple to use and contain lots of excellent features - something upon which DP have built a very strong reputation in the QL market... Overall, the speed-up (of just the first release of PERFECTION - it is much faster now) on even a humble QL with Trump Card is amazing when compared with Quill (or any other word processor). On top of this, the program provides many excellent and well thought out features, each of which is easy to use... (it) is certainly years ahead of the competition on the QL (and even on many PCs)." > R.Mellor, c/o CGH Services, Cwm Gwen Hall, Pencader, Dyfed, SA39 9HA; Official Review of the very first version of PERFECTION in QL TECHNICAL REVIEW issue 7: and the reviewer personally bought his own copy of this program, and many others at full price, from Digital Precision. Earlier QLTR reviews pronounced LIGHTNING (just the standard version) superior to the competition and ADVENTURE CREATION TOOL excellent.

✓ "PERFECTION SE is superb!! With Gold Card, it puts life in the fast lane. Thanks." > Leonard Singleton, Bletchley, MK3 6BP, June 1993, a full price purchaser (=fpp).

✓ "As a recent user of PERFECTION PLUS SE, may I add my thanks and praises to the ones I am sure you have already received... keep up the excellent work." > R Slawson, East Molesey, Surrey, KT8 0BP(unsolicited letter from full price purchaser).

✓ "At about 360,000 words, the Mega SPELLCHECKER dictionary does not have much competition, on any computer! (Spellchecking) is about four times as fast as the best figures I have seen with other checkers on QL and PC." > SINCLAIR QL WORLD magazine official review of PERFECTION spellchecker, September 1992 issue, by Bryan Davies of Troubleshooter repute (review copies of all the competing products supplied to SINCLAIR QL WORLD by their respective publishers).

✓ "In the past I have purchased a number of your programs and have never failed to be impressed by the quality of both product and documentation. (So) please send a list of your current products." > V.Negri, Hempton, Norfolk, NR21 7LF, June 1993, fpp.

✓ "This is my first letter with PERFECTION SE. I must say I'm impressed with it and it is certainly fast. Hooray, goodbye to Archive!" > P.H.Heilbron, Reigate, RH2 0DJ, a full price purchaser now using PERFECTION to replace not only Quill but Archive too.

✓ "I have been using PROFESSIONAL PUBLISHER for about eighteen months now... what you can do with it is colossal... I got Digital Precision's QUICKLASER. The results are as good as (Digital Precision) says in its advertisements..." > P.Hamill, Peterborough, Cambs, PE8 6RH, QUANTA magazine, Volume 9 issues 4/12. Mr Hamill (full price purchaser) then makes suggestions to users re optimal page sizes.

✓ "Once again I would like to say thank you for your help. I would like to tell the world what nice guys you are but unfortunately I have no contact with the outside world." > J.Bailey, Godshill, Ventnor, PO38 3JJ (full price purchaser, 24 May 1993).

✓ "PC CONQUEROR GOLD SPECIAL EDITION is an excellent product, accompanied, as so often with Digital Precision software, by a comprehensive and informative manual. The program does a difficult job, and does it well... Overall, this program is much faster, more compatible and capable..." > SINCLAIR QL WORLD Official Review, March 1993 issue, by M.Knight (bought many DP programs full price).

✓ "With printing of the quality that this page bears witness to, I am a very satisfied PERFECTION user. I hope that you continue to provide the software innovation and the accessible backup which is great. So, thank you very much again and may I wish you every good fortune." > P.Stewart, Temple, London, EC4Y 9BE, 10 May 1993, fpp.

✓ "Many thanks for the update of PERFECTION SPECIAL EDITION. I am suitably impressed. Congratulations on producing the only word processor that I know that offers the best of all worlds as far as formatting is concerned. After Quill, PERFECTION is like a breath of fresh air." > Geoff Wicks, 1097HL Amsterdam, Netherlands (unsolicited letter dated 13 June 1993: all software including LIGHTNING PERFECTION SE, PRO PUBLISHER, CONQUEROR SE etc. purchased at full price).

✓ "All I can say about QMATHS is: WOW!" > Robin Wyke-Holloway, Salisbury, SP5 4WG (unsolicited letter received April 1993: Mr Holloway is a full price purchaser).

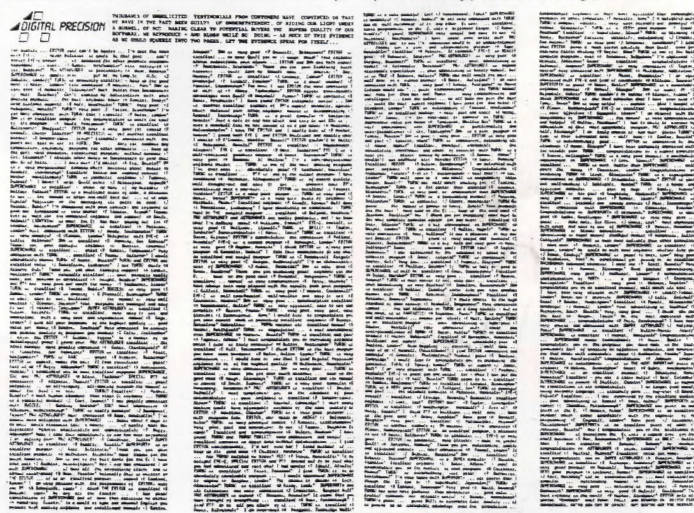
✓ "I have had PERFECTION from the early days and have had many hours pleasure finding out more and more of its brilliant features. May I offer my congratulations on such an easy to use program which does everything I want - and more besides." > F.Merrison, Pinner, HA5 5AZ, fpp, thanking us for fixing a printer problem he'd had.

✓ "Having used a range of desktop publishers on the Atari ST & Amiga, I admit I am very impressed with the superior performance of PROFESSIONAL PUBLISHER. It contains everything required" > SINCLAIR QL WORLD January 1989 issue, article entitled "Six of the Best" which also praised five other new Digital Precision programs.

✓ "I find it difficult to express my gratitude for the speed of your response, and for the opportunity to see inside two excellent programs which I have long enjoyed using." > Richard Walker, Enniskillen, BT74 7LG, full price purchaser and QL expert.

✓ "May I take this opportunity to say that I have, in the past, found the software you have supplied me with (LIGHTNING etc.) to be of extremely high standard, on a par with that found in industry-standard PC packages. Keep up the good work. Without your quality software, I would be forced to abandon the QL and go to a PC." > G. Reynolds, Crosby, Liverpool, L23 0SS (unsolicited letter dated April 2 1993, placing a further order for DP software: all programs old & new were purchased at full price).

✓ "This is but a casual selection, drawing only on extracts from recent letters and reviews. We could locate >1000 complimentary communications but we'd prefer to spend our time producing new programs! We refer potential customers (existing users of DP products already know how good they are) to pages 18/19 of the September 1988 issue of Sinclair QL World, which contained well over three hundred other unsolicited quotations from happy Digital Precision customers. That collection covered only three programs (and that too only partly - we ran out of space) and predated the release of what many consider to be our best software (LIGHTNING SE, PERFECTION SE, PROFESSIONAL PUBLISHER, CONQUEROR SE etc). We reproduce those pages below, duly reduced to fit. If you want a readable copy, consult the relevant back issue or send us an SAE or ask for a full-sized copy while ordering from us..."



So hear it from their customers!

Editor

Helen Armstrong

Publisher

Mark Kasprovicz

Advertising Manager

Jim Peskett

Creative Director

John Stanley

Graphic Artist

Stevie Billington

Magazine Services

Linda Miller, Frances Maxwell,
 Pauline Wakeling

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The Blue Barn,
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Woodstock,

Oxon. OX7 1HA
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Everything promised, and an article on Neural Networking and AI on the QL

PERFECTION SPECIAL EDITION

AN EXCITING NEW DEVELOPMENT - Version 5!

In the case of many word-processing objectives, the best way to implement them is pretty clear. There are some areas, however, where individual tastes and preferences can differ very widely. One such area is the reformatting of text - the adjustment of previously entered text to conform to margin, indentation, justification and pagination settings after you go back (or forward!) to it and make alterations, either by hand (by typing and/or deleting) or by using individual or global search and replace. When new text is being entered at the foot of the document or at the end of the current paragraph, all word-processors behave virtually identically, obeying the current settings - it is in the matter of amending existing text (inserting, changing or deleting) where conflicting philosophies apply. Text-handlers differ in their treatment of this: Editor, Wordperfect, text⁸⁷, Quill, AmiPro & Word all behave differently.

Editor, Spy, most versions of Wordstar, and all technical editors leave all reformatting to you. While at first this may seem harsh, this manual mode gives you a lot of control, makes the handling of tables and other technical applications better (do you really want to reformat that BASIC program into a single paragraph!?!), and is easy on the eye. But you must remember to reformat as the program won't, and this may be an annoyance. If you move away and forget to clean up, your printout will probably be incorrect.

Wordperfect **will** auto-reformat, but generally only when you move the cursor from the line containing the change. Changes you make while your cursor is within the line will only cause the line to contract or expand up to the margin. This too is easy on the eye, but there is the drawback that the overall picture of the page may be inaccurate while you are inserting or amending text, and that when you move the cursor away (and hence trigger the auto-reformat), you may not notice any undesirable effects caused (e.g. widows, orphans, inappropriately positioned page or line breaks).

QL Quill auto-reformats, but because of its slowness it uses a trick: often when you start inserting within the middle of a paragraph, Quill splits the para in two and creates temporary blank lines to separate the parts. This means Quill does not need to reformat until you have finished amending. What you type appears at the end of the first part of the paragraph. This has the advantage and disadvantages of the Wordperfect method, but additionally the split can be a bit disconcerting and the screen display can be grossly wrong during the editing. Also, we know of a bug that causes a line to be shown twice on the Quill screen while it is only really present once: you will regret it if you delete the apparent duplicate as an unduplicated line will get deleted without warning.

Word (a fine PC Windows program) auto-reformats in situ, in real time, as-you-type. But if you have a long complex para and you are editing near the top of it, you may notice the time taken for the reformat *even on a 486/66MHz* (QL users should note that this is >20 times faster than a Gold Card i.e. about the speed we expect from a *fully tweaked* QXL). Also, cursor movement will appear to some as a bit erratic (which is hard on the eye) especially if right justification is on or if the on-screen fonts are proportional. It can also be quite distracting to keep seeing the ripple effect of changes as text on lower lines is reformatted. AmiPro is somewhat better in this respect as there is a small delay (almost a second) before AmiPro refreshes lower lines on the screen: easier on the eye.

The new release of **PERFECTION SPECIAL EDITION**, version 5, gives the user the best of all worlds, by combining the best of all the above methods and avoiding all the drawbacks. The user is given the opportunity both to pre-configure and to adjust at will from inside the program, the desired auto-reformatting behaviour. The options are to either select Never (giving Editor-like action for technical users: this is what all previous versions did, where you had to press a key to get the para to reformat after re-editing it), Instant (giving in-situ real-time automatic reformatting as-you-type, as does Word) or User-delay, the most flexible setting of all

(giving slightly delayed updating of lower lines of text, like AmiPro, but also - and unlike AmiPro - giving you, the user, full control over how long the delay is). No other w.p. is this able.

On User-delay the user is free to set any delay from 0.1 seconds to 99.9 seconds in 0.1 second steps. About 1-2 seconds is best for slow typists, and 1.5 seconds is thus the default. This means that you are not hassled by continuing screen changes on lines below the one you are editing and concentrating upon, or shufflings around on the current line caused by right justification etc. So the Word disadvantage (much more noticeable on slower hardware) is avoided, without recourse to the Quill temporary blank line nuisance. When you pause in your typing for longer than the set delay, **PERFECTION SPECIAL EDITION (SE)** automatically tidies up, without you having to do anything (getting around the Wordperfect and Quill drawback of making you mentally adjust for the screen remaining occasionally out-of-sync with reality).

If you are a reasonably fast typist, you can experiment with shorter delays (say 0.5 seconds). If you are a speed demon, set the delay to 0.1 seconds and see if you can ever manage to "get ahead" of the program! Settings of under 0.3 seconds are indistinguishable from 'Instant', when reformatting always keeps pace.

On the User-delay setting **PERFECTION SE** will, as does Quill and Wordperfect, auto-reformat *instantly* (no matter how long a delay you have set) if you either navigate off the line or invoke **any** menu or direct command (including Save, Export etc.). This means that you are never left with the document "wrong".

There are many other improvements in this release of **PERFECTION SE**. One in a similar area is with SHIFT/CAPS, the one (out of five) manual reformatting commands that allowed reformatting of a para from the current line onwards without affecting previous lines. SHIFT/CAPS will now additionally obey the indent margin (which matters if the cursor is on the first line of the para) and, more significantly, it will leave the cursor position unaltered within the text (previously, it used to move the cursor to the start of the next para). Other reformatting commands are unaltered, so you can still step through paras reformatting easily.

PERFECTION SE v5 costs £99.95, or £139.95 in **PPLUS SE** incarnation (i.e. with spellchecker, dictionaries & maintenance programs), less discounts that can total 40%. There is no special upgrade price to v5 for existing **SE** owners - only DP's usual reasonable £10 update charge (but as an offer to **QJR** readers, open for four weeks from the date of publication of this issue, existing **SE** or **PPLUS SE** owners can get the upgrade totally free provided they order other DP programs of total value (after all discounts) exceeding £25). To upgrade from the STANDARD version of **PERFECTION** costs, as with all upgrades, the difference in price plus just £10, i.e. £50. The user should not return any documentation, just the one master disk. Remember special deal prices, which give discounts of up to 25% if more than one program is purchased (or upgraded) at the same time (do you have **LIGHTNING SE**?). To get the very best out of **PERFECTION SE**, use it with **PROFESSIONAL PUBLISHER** (and perhaps with attendant **TOOLBOXes** and **FONT ENLARGER**), when you can output text to any number of shapes of any desired complexity (not just boring columns!) throughout maintaining pixel proportional spacing and having thousands of fully WYSIWYG fonts to choose from, whatever your printer....

All trademarks are acknowledged as belonging to their respective owners.

OTHER SPECIAL PROGRAMS FROM DP

PC CONQUEROR GOLD SPECIAL EDITION The rave review on pages 16 to 19 of March 1993 QL World really says it all: "an excellent product", "much faster, more compatible and capable than its predecessor". There are many extra features too. You can also get DR-DOS v6.0 (with Netware Lite free), which is the best DOS of all. And if you are buying or have bought this DOS from us, you can buy preconfigured DOS pseudo hard disks (on ED diskette) for £15 each (specify if you want compressed i.e. 6Mb capacity, or 3Mb; or have one of each for £25).

QMATHS MATHEMATICAL SYSTEM PART TWO A superb companion to QMATHS, with maths, stats, Abacus stuff, expression evaluation, terrain plotting, the fastest Mandelbrot routines and much more. Note the special price for 1+2.

TRANSFER UTILITY SPECIAL EDITION Copies and transfers, with optional sorting, case-changing, formatting, statistics and more.

QUICKLASER Superb print output from PRO PUBLISHER to HP Deskjets, Laserjets (the latter with 1Mb of RAM or more) and all compatibles. QUICKLASER costs just £19.95 all inclusive.

LIGHTNING SPECIAL EDITION GOLD CARD VERSION Optimal speed from higher specified QLS - GOLD CARD, QXL, ST/QL, Thor XVI etc. Free upgrade from standard version if you return ROM + disk and are ordering something else at the same time, else £10 charge.

PERFECTION PERFECTION PLUS

Perfection is the finest word processor available for any computer. We have received dozens of letters from happy users saying just this... and all of these letters were unsolicited. "Superb" was used most often.

Perfection manages to achieve all the sophistication of the most complex PC word processors while still using a user interface as friendly as Quill's. Perfection has a dual system of user control: menus while you are familiarising yourself with the program, and direct commands for the time when you feel ready for more adventurous things. The two systems can be used interchangeably and even simultaneously. Even more exciting - both systems are iterative. In case you don't understand what this means, let us give you an example: suppose you wished to move a block of text using the menus. You would choose Block Move (yes, it is right in the first menu) and the screen would then tell you to move your cursor to the start of the block. On most word processors you would have to navigate manually to this position: indeed, on many of them (Quill included) only a subset of the normal navigation commands would be available. On Perfection, not only can you use all the manual navigation commands (viz all 28 permutations of CTRL, ALT, SHIFT and the arrow keys!) but in addition you can use direct commands like GoTo Line or Page or any of eight markers. Even more amazingly, you can use Search (either as a direct command or from the menus) even though you are already 'within' a menu option.

Perfection has about 200 commands, but the layout of menus and the choice of keys for the direct commands makes it very easy to master. Though a 100+ page manual is provided (with all the important bits right at the front), you should only need to consult it for specialised operations like macros.

Even if speed is not particularly important to you, we assure you that Perfection's lightning performance will enable you to use the word processor in sensible ways that you would not have dreamed possible before. For example, scrolling 100 pages or so is accomplished so quickly using the normal navigation commands that you do not need to bother using a menu option to do the move. Spellchecking, assuming you have Perfection Plus, is accomplished virtually instantly: to spellcheck this whole ad (all the pages) would take under 1.5 seconds... Searching (you can switch case sensitivity, as well as equivalences between tabs, soft spaces and hard spaces) is at the rate of about 100 A4 pages per second.

Moving from one word processor to another is usually very traumatic. With Perfection, this will not be the case. Not only can Perfection read in Quill .doc and .exp files directly (you do not even need to tell it they are Quill files!) but it can make direct and immediate use of your existing Quill printer driver. File re-export is also possible.

Perfection is truly WYSIWYG: this means that bold appears bold on screen, italics appear as italics, underlined as underlined, and so on. Of course, your printer may have functions we do not know about (upside down?). To deal with these, Perfection provides a number of on-screen shaded strips: these can be attached to any printer function you wish, and will not upset justification as a translate would. Of course, translates are provided as well!

A variety of statistics on the document being processed are available: some of them are on view all the time, the rest can be toggled to instantly. Not only is there a word count, but also page, line, character and special character (like Superscript Off) counts. There are also a dozen status indicators, letting you know whether you are in Insert or Overwrite mode, whether a block is defined, whether interactive spellchecking is enabled etc. Current line (from top as well as within page) and column positions and character codes are also available.

A terrific feature of Perfection is the dual screen mode. You can view one part of the document while editing another. The sizes of the two windows are themselves adjustable, both in real-time or via the configurator. We should devote more space to the configurator: however, it must suffice to say that everything that could be dynamically set within Perfection may also be preset with the configurator. The configurator can, for example, allow you to select any of 256 colours for any of a dozen parameters (like paper colour, border colour, status window ink and paper colour etc).

Perfection is fully multitasking without need for any external accessory: however, if you already use QPAC or Taskmaster or similar and are happy, you may go on doing so.

There is absolutely no way that we can prepare you for the quality 'feel' of Perfection. We have a great deal of experience using PC word processors costing many hundreds of pounds: with absolutely no exception, Perfection is far easier to use and master.

So if you thought Perfection was unattainable, you have a very pleasant surprise coming to you!

LIGHTNING SPECIAL EDITION LIGHTNING

These programs accelerate QL operation by up to 10x (2x -4x is typical) without having any adverse effect whatsoever on compatibility or anything else. Lightning SE is typically 40% faster than the standard version. This acceleration is totally independent of, and in addition to, any speed-up obtained by hardware means. So if you have Gold Card, your need for Lightning SE is just the same as if you had only an unexpanded QL - Lightning SE will accelerate both by the same ratio.

The Lightning programs achieve their acceleration by automatically paging out sections of the QL's operating system and replacing these with optimal, concise code written by us.

Lightning installation is a completely automatic and one-off: no knowledge of computing or programming is required. Once installed, Lightning can be completely forgotten about - you will soon get used to the superb speed! Knob twiddlers are catered for too.

Lightning technology is not built in to any of our other programs. Perfection users (as well as users of all other QL software) should therefore use Lightning all the time.

In summary: if you do not have Lightning, you are wrong. Buy this one FIRST OF ALL!

PROFESSIONAL PUBLISHER

The Professional In Professional Publisher refers to the quality of output from that program, and is not meant to suggest any complexity of operation. Few programs are as easy to use as this one: > 99% of users will be able to do with-

a manual! Professional Publisher is by far the best DTP program for the QL. It is fully compatible with Perfection, Editor, Quill, Eye-Q & the ASCII editors. It allows you to both create and import both text and graphics. Text can be 'poured' into boxes of any shape, size and number, automatically maintaining justification and hyphenation settings. So flowing text around graphics is a doddle.

Professional Publisher is supplied with a generous selection of fonts of various sizes, as well as clip art.

Justification is by pixel, not by character. This gives a much smoother effect.

It is pointless for us to try to list all of Professional Publisher's features - we would end up filling half the magazine! We will concentrate on just a few 'points': Professional Publisher is extremely precise, performing all its computations accurate to a small fraction of a millimetre. All its features can be preset by you using its configurator, ruling out the need for repetitive key strokes.

The program is extraordinarily versatile while remaining intuitive in its user interface. Buy it!

PROFESSIONAL PUBLISHER TOOLBOXES

Toolbox I is an excellent collection of high definition fonts, clip art and utility programs for Professional Publisher. While the fonts supplied with Professional Publisher are excellent, many users will feel the need for a wider range of typefaces and styles.

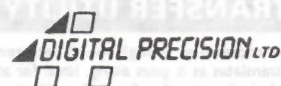
Toolbox II starts where Toolbox I leaves off, providing an even better - and different - font collection.

The two Toolboxes complement each other and are available together at a special price.

FONT ENLARGER GRAFIX

Font Enlarger does exactly what you would expect it to from its name. While Professional Publisher is also capable of enlarging fonts, it does them 'on the fly' and consequently is not able to remove the jaggedness caused by magnification. Font Enlarger is much cleverer, and enhances detail without any step effect.

While the built-in printer driver for Professional Publisher is excellent with 9-pin printers, it is not optimal with 24-pin or laser printers. Grafix is.



EYE-Q ULTRAPRINT

Eye-Q is the finest graphics program for the QL. While there may be other graphics programs with a few more features, no other program comes anywhere close to Eye-Q in sheer enjoyability. Eye-Q develops a pleasurable tactile relationship with you, and makes you feel like an artist (even if you aren't). Eye-Q graphics can be read in by Professional Publisher, and the latter's pages can be exported to Eye-Q (using Toolbox I). Everything in Eye-Q is menu-driven and there is context-sensitive help.

While Eye-Q has its own printer driver, Ultraprint allows you 22 distinct styles/sizes of printer output. The reasoning is that the scale of gradation suitable for pictures is probably unsuitable for text or line drawings.

PC CONQUEROR SOLUTION

PC Conqueror makes your QL into a PC-compatible machine, automatically. It does this by software means only, so there are no screws to undo or wires to fiddle with. Your QL stays a QL too.

Why, might you ask, should you wish to make your QL into a PC-compatible? The reason is simple: you may wish to run the same programs at home as you do at work. Alternatively, you may wish to tap into the vast storehouse of PC software of every type and description you could imagine.

Using PC Conqueror could not be easier. Just boot up your machine with the PC Conqueror disk in floppy 1 and within 10 seconds your QL will be transformed into a PC that is just waiting to be switched on. From this point on you will do exactly the same as you would if you were running a 'real' PC - this means putting a DOS disk (any version) into one of your drives and pressing a key. If you do not already have legal access to a copy of DOS, we can provide you with one at reasonable cost (see our price list).

PC Conqueror runs as fast as it is possible for a PC emulator to run: we have used all our skills to make it work quickly. Of course, you can make the emulation must faster by using Gold Card and Lightning SE. With this combination, you should get speed noticeably better than that of a PC XT...

PC Conqueror allows you to fine-tune the operating environment of the PC in order to improve performance. If you get a hard disk or other high capacity floppy system, you can utilise part or all of it as a PC hard disk.

PC Conqueror occupies under 80K and leaves 667K free for DOS when run on a Trump Card. This is more than you will get on a 'real' PC.

Solution does what Conqueror does but is about half as fast and is not quite as compatible.

SPELLCHECKER MEGA DICTIONARY

Spellchecker is what makes Perfection into Perfection Plus. We have made it available as a separate item for two reasons: (a) to allow Perfection owners to add it later (b) to allow users of other word processors to benefit from the very best in spellchecking technology.

Spellchecker is supplied complete with three dictionaries of differing sizes as well as a system for building, reviewing and maintaining user dictionaries.

Spellchecker's ultimate accessory is the Mega Dictionary, which gives the user a vocabulary of over 350,000 words!

3D PRECISION CAD SYSTEM

This program allows you to manipulate shapes and figures in 2D and 3D at a speed that will leave you breathless. Irrespective of whether your interest is in CAD, in animation or in just having fun, this program should not be missed. You can output to plotters directly from it, or alternatively create graphics screens to be manipulated and output by Eye-Q, Ultraprint or Professional Publisher.

SUPER SPRITE GENERATOR

SSG moves things about the screen very fast and very smoothly, without flicker. Sprites can have up to 16 frames.

MEDIA MANAGER SPECIAL EDITION MEDIA MANAGER

Media Manager Special Edition (MMSE) is a program to be used both when things have gone wrong as well as when things are perfectly OK. It allows for automatic, semi-automatic and manual correction of a huge variety of disk and tape problems. It allows you to explore disks and tapes to your heart's content, producing all sorts of different diagnostic reports. MMSE is very simple to operate, being menu-driven and assuming no degree of computer knowledge whatsoever.

MMSE also allows you to tidy, catalogue, sort and order your disks and cartridges.

The standard Media Manager is both less powerful and less user-friendly, but manages to work on an unexpanded QL.

Both programs allow for data transfer between PC and QL. With MMSE, this transfer is at file and directory level, is bi-directional and is completely automatic.

SPECIAL DESKTOP PUBLISHER DESKTOP PUBLISHER

These programs are quite primitive compared to Professional Publisher. However, if you have not experienced that program as yet, you will find both of these very competent. Both are capable of producing excellent results. The cheaper one has fewer features but is able to run on smaller systems.

EDITOR SPECIAL EDITION THE EDITOR

With the sole exception of Perfection, this is the best word handling system on the QL. Editor's features include an unrivalled degree of programmability and the ability to cope with the entire 256 character ASCII set. The Special Edition has enhanced document-type facilities, including column blocks and on-screen page break displays. Neither program is suitable for computing novices. Until Perfection, Editor Special Edition would have been our 'Desert Island Program'.

Editor SE can do a few things that Perfection can't, so the ideal combination is to have both (they are compatible at file level and can multitask). If you order Editor SE at the same time as Perfection, you can have Editor SE at half price.

PROFESSIONAL ASTROLOGER PROFESSIONAL ASTRONOMER

The Astrologer program teaches you Astrology from scratch and enables you to automatically produce text narrative on personality delineation, year-to-year and minute-to-minute life predictions, compatibility interpretations and so on. Whether or not you believe in astrology – indeed, especially if you do not – this program is one that you cannot afford to have. You can tailor the readouts (both in terms of quantity and what is said) to your own particular requirements. The amount of fun you can have with this program is endless. Do not blame us if you start believing in astrology, though!

Astronomer is an extremely fast and accurate solar system calculator, with planetarium views, planet faces, eclipses, cinerama display etc..

TURBO BASIC COMPILER

Turbo is the finest BASIC compiler for the QL and arguably the finest BASIC compiler for any computer!

Turbo automatically converts working BASIC programs into optimised machine code, usually with no need for human intervention. The benefits of this conversion are vastly enhanced running speed (as well as much faster loading, encryption and automatic bug fixing for a variety of QL interpreter oddities). Typical speed-up is 40x – 100x.

Turbo is provided with a 200 command toolkit, adding many useful commands to BASIC. Most of these commands will be of immediate use to the programmer, whether he is a novice or an expert. There are commands to load strings and floats into RAM, and to extract them automatically; to search memory and to move its contents; to control jobs and change their priorities, manage pipes, allocate and deallocate memory, to control both rubber and virtual arrays, to present INPUT with an editable default, to have random access to files and much more.

TOOLKIT III

Toolkit III starts where Toolkit II stopped, adding about 60 new commands and enhancing many existing dual functions. Toolkit III is available either on disk or on ROM, and works whether or not you have Toolkit II.

Toolkit III commands can, with only a couple of exceptions, be compiled using Turbo.

QFLICK CARD INDEX

All QL owners have a copy of Archive, supplied free with the QL. While Archive is competent, it is very hard to get to grips with and is not particularly fast. QFlick presents a very convenient alternative – a snappy, simple-to-use, point-controlled card file database. You can move data between QFlick and Archive in either direction.

QFlick is not itself programmable but we document its data structure and give guidance on how to program it using Turbo.

ARCHDEV + RTM DATABASE ANALYSER ARCHIVE TUTORIAL NAMES + ADDRESSES MAILMERGE DAT-APPOINT SEDIT SCREENPRINT RECOVER

This suite of utilities will greatly enhance your use of the Archive database system.

Archdev + RTM is a straight replacement for Archive: It gives enhanced speed, greater workspace and a much cleaner boot-up. All your existing applications will work.

Database Analyser provides very fast and comprehensive statistics about your Archive databases.

Archive Tutorial proceeds systematically through the whole philosophy and grammar of Archive, providing you with expert and patient guidance.

Names + addresses, Mailmerge and Dat-Appointment are ready-to-run, off-the-shelf Archive applications, providing an address database, mailmerging and appointment diary respectively. You now have no excuse not to use Archive.

SEdit allows you to create and edit screen format files in Archive. Screenprint allows you to print them out.

Recover allows you to get back lost Archive databases, created when you switched off the computer without properly exiting from Archive.

XREF SUPERBASIC MONITOR BETTERBASIC EXPERT SYSTEM

XRef analyses the structure of a BASIC program, providing detailed reports on things like variable usage, what calls what, dynamic call hierarchy of procedures and functions, and so on.

SuperBasic monitor actually monitors and reports on the performance of BASIC programs as they run under the interpreter.

BetterBasic analyses and automatically corrects structural flaws in your programs and allows you to customise things like indentation, number of statements per line, filtering out of noise words, etc.

The three programs together provide a matchless diagnostic and auto-correcting facility for BASIC programs.

TRANSFER UTILITY

This program copies files at high speed between devices, performing translates as it goes along. Ideal for all sorts of applications, including transfers from microdrive to disk.

QMATHS SYSTEM

This is an Incredible mathematical compendium for the QL. Pride of place goes to the symbolic problem solver: this can solve equations, simplify expressions, factorise, expand, etc. all symbolically. If you could sneak this one into a maths examination, you would have a formidable ally. QMaths knows about all the algebraic operators, powers, roots, brackets, trigonometry, matrices, determinants, vectors, factorials, permutations, combinations, binomials, exponentials, logarithms, hyperbolics, inverse functions, infinite series including Taylor & Maclaurin expansions, complex numbers, conversions, Fourier series, and lots of calculus: both differential and Integral, including integration by parts and definite Integrals. QMaths optionally displays its workings and comes with a superb interactive tutorial.

The package also contains an Interpretive, fractal, image-generating language with loads of beautiful fractal programs supplied for you to use and edit – no programming skill is required.

There is also a multiple precision floating point maths package, giving calculations at precisions up to over 600 decimal digits of accuracy.

There is even more to this system, but we think we have told you enough.

QMON MACHINE CODE MONITOR

The latest version of Tony Tebby's superb monitor: an absolute must for those who really want to know what is going on in the QL. No other machine code monitor even comes close.

Do not confuse this program with SuperBasic monitor, which monitors SuperBasic, not machine code.

COMPARE

This program compares files – data or program – at colossal speed. Where a mismatch is detected, the relevant areas are highlighted and you can shuffle, displace and align very easily.

CASH TRADER WITH ANALYSER PAYROLL

Cash trader with Analyser is an accounts system designed by businessmen and not by wretched accountants! Consequently, it has excellent reporting and management facilities, and is very flexible. It is aimed primarily at the layman, probably a sole trader running a small or medium sized business. All the features you would expect – including audit trail – are present.

Payroll is a reasonably flexible system designed to automate the payroll function in small businesses.

Both programs are configurable, with editable defaults letting you adapt the programs from year to year.

HARDBACK WITH FINDER

This is the ultimate hard disk backup and management utility, with all the sophisticated features you could want. User dialogue is via overlapping pop-up windows – the whole program just feels right. It is possible to scan the disk at great speed, too.

DISKTOOL WITH QUICKDISK

This permits you to add password protection to disks, to optionally increase disk storage capacity on DSDD drives by 36K and to increase speed of access by as much as 30%. All this is done while maintaining full compatibility. Automatic file management is also provided.

DIGITAL C SPECIAL EDITION DIGITAL C

These are extremely fast and efficient C compilers, complying with and surpassing the Small C definition. The Special Edition goes much further, including support for structures, pointers, long pointers, >64K code size, direct access to QDOS traps, etc. The Special Edition C generates code that runs about twice as fast as the other.

SPECIAL DEALS

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Upgrades cost difference in price + £10
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For full terms and conditions, please refer to any of our QL World ads from Jan-Nov 1990, or write in including a SAE

CPORT IMPROVED VERSION

A brand new CPORT system, enabling you to rapidly convert your SuperBASIC programs into C (ANSI or Lattice). The new (October 1992) version is now as close to being fully automatic as makes no difference – you must get it!

Owners of our earlier CPORT versions should return disk + SAE for a free upgrade.

SUPERFORTH COMPILER WITH REVERSI

Forth is the most logical computer language. This compiler produces multitasking code. The manual teaches you Forth-83 from scratch.

IDIS SPECIAL EDITION IDIS

These Intelligent disassemblers make the otherwise terrifyingly complex task of understanding other people's machine code programs absurdly easy. The SE version, which has a higher hardware requirement, sorts out some routines, replaces addresses with names, untangles data from code and much more.

QKICK FRONT END SYSTEM

This is a simple, easy-to-master, pull-down menu controlled multitasking front end. QKICK runs in the background and can be called up at any time. It provides you with notepads, sophisticated file/sector/RAM handling, backing up facilities, a clock, diary, calculator, mini-database and so on.

ADVENTURE CREATION TOOL SPECIAL EDITION

ACT is a must for every programmer. The name of the program is misleading, insofar as it has capabilities far beyond the 'mere' creation of adventures. ACT has utilities providing animated graphics, data compression, language design, parsing, maps, object-oriented control etc. If all you want to do is generate adventures, though, you do not need to be a programmer to use it. This is a purchase you will never regret.

PEDIT

A fast, modern and capable printer driver for the programs bundled with the QL.

MICROBRIDGE

Superb contract bridge bidder (ACOL etc) and player, using millions of random but reconstructable hands. Microbridge also includes a state of the art interactive bidding tutor and a clear instruction manual. There is nothing like this anywhere else!

SUPER ASTROLOGER

A very cut-down version of Professional Astrologer – still great fun, though!

SUCCESS CP/M EMULATOR

Allows your QL to run CP/M programs at great speed.

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TROUBLE SHOOTER

Some concrete stuff on the QXL and SMSQ from Bryan Davies.

Version 5.08 of Perfection Plus Special Edition has been released. People who have bought Perfection SE versions 5.01 to 5.07 (with or without Spellchecker) can exchange their versions for 5.08, free of charge; they should send a stamped, addressed return envelope, or an International Reply Coupon to cover the cost of postage, and the original Perfection program disk, to Digital Precision. Make sure that any return envelope is strong enough for mailing a disk, and that the postage is sufficient. Digital Precision state that version 5.08 has fixed "all known bugs".

QXL News

This comes in two forms - "a little birdie said" and "from the horse's mouth". You will have to guess which is which. The latest software for the QXL (as of end-July) supports floppy and hard disk drives, parallel port, the KEYROW command, Mode8, and 800 x 600 pixels resolution. Quill, Easel and Archive seem to run fine on the QXL, at a decidedly brisk pace. Perfection runs at about 4.5 times the speed it does on a Gold Card QL. Many of its commands were already carried out too fast to follow on the GC, so hang on! It is reported that one program (name unknown) has been checked at 11 times its GC speed. Conqueror (standard and Special Edition) works with the QXL, the performance of the SE version being very pleasing. The enhanced screen resolution is good news, but it will be of use only with those programs that can make use of it, such as some Pointer Environment pro-

grams. As Text87 Plus-4 makes use of the enhanced resolution available on the Atari, it seems likely it will be able to offer an improved display with the QXL also.

Miracle Systems have never been enthusiastic about running the Gold Card at more than its rated speed (by means of The Poke). They will presumably frown upon the idea of running the QXL at well above its standard 20 MHz, but a report says an increase of 30% over the standard has been tried, with success. One thing to remember when over-running chips in this way is that heat generation increases with operating frequency, and life expectancy decreases with increase in heat. That is, you may get improved performance but you may also find the cpu chip getting unreliable, and even dying.

QLSpeed, the Archive-based test written by Eros Forenzi, provides a useful benchmark for the QXL. Eros reports a figure of 29 seconds for this test, as compared to the 123 seconds of the standard Gold Card. The only QXL I have seen working, so far, recorded 35 seconds. This is a fair performance increase, but it seems likely there is more to come. The Gold Card, when boosted by the POKE that increases effective clock speed to 24 MHz, records about 84 seconds. This reduces the QXL's advantage appreciably, but still leaves it well ahead.

What really matters to users is the way commercial software is handled. From my observations, Turbo Quill certainly runs very smoothly, the scrolling of text for example being both fast and steady. As one would expect, Perfection is very brisk, but there are some keypress problems to

be ironed out. Ambition, the business game, looks good, too. One aspect that is initially strange is the small space the QL screen occupies on a normal VGA monitor. The reason for the display not being fully utilised is that the transfer to the new display is pixel-by-pixel, with the result that only 512 x 256 of the possible 640 x 480 pixels on a VGA screen are used. Users of some Pointer Environment programs should already be benefitting from the greater resolution those programs support.

Switching between MS-DOS and the QXL is prompt and apparently reliable, and the QXL can be used under the Windows GUI. It is reported that the QXL also works under the DESQview interface, which is good news because that is a much more efficient program for multi-tasking and switching than Windows is. There are several things to be sorted-out in the running of SuperBasic, and of compiled programs; default directory access is said to be a bit uncertain, too. More importantly, there was no sign of trouble accessing both floppy and hard disk drives.

And more

A few more odd QXL reports, courtesy of Gerard Phelan: "Dave Walker is using 800 x 600 resolution successfully, with Pointer Environment programs. He is finding text hard to read on a 14-inch display at this resolution, but says it is fine on a 17-inch display. This is the same as I have found when using Windows, and it has forced me to get a 17-inch display; this has made life much easier for my

eyes, but at a high price.

"C68 3.05 programs run correctly (the report said that "all" such programs run correctly, but that is too brave a claim, surely?) There is no need to re-compile C68 programs."

The wide range of hardware to be found in PCs will inevitably create a few hiccups with the QXL, but Miracle are aware of some potential problems and are working on them. As is their normal practice, they intend to operate a generous software upgrade policy. It is clearly easier and, hopefully, cheaper to send out a disk with new software than to send out a rom chip, as had to be done with Trump Card and Gold Card. The hardware seems to be working satisfactorily, so early buyers should not be placed at a disadvantage. The main thing is that the QXL is now available.

Ram prices - a political question in the UK

Think carefully before deciding on how much memory to buy with your QXL. The price being charged for extra ram, above the basic 1 MB, is a fair one. Buyers saving a few pounds now, on the basis of installing extra ram chips later, may find it costing them a lot more than they planned on. Memory prices are subject to a number of major factors, obvious ones being the current level of worldwide demand, and import tariffs. The written word of the present time suggests demand for rams are high, and tariffs are either already here or on the way; that is, memory prices may go up in the near future.

Our "free market" EC has imposed a tariff of about 5 to 45% on imported floppy disks. Are there any non-imported floppies? A similar tariff is presumably still in force on printers, and it seems reasonable to assume memory is treated similarly. Wherever there is an "indigenous source of supply" to be propped up, the EEC imposes duties, which the consumers - us - pay. The computer buyer may never have heard of a European chip or disk manufacturer, and the printer names we know are not European either, but the manufacturers we may never buy from are being supported by tariffs (and subsidies, of course). Whatever your politics, bear in mind that ram prices have been low for the past few years, but have edged up noticeably this year (only partly because of the devaluation of the pound sterling).

SMS

There are no doubt other users who are somewhat unclear as to what the "SMS operating system" is. We have heard of it in connection with the Atari QL emulator, the QXL card, and a project (or projects) to develop a new super operating system, but there does not appear to have been a clear statement of what the various sets of letters signify. Unusually, someone has now taken the step of printing a single A5 information sheet, about SMS2, making a part of the story understandable. It is made clear that SMS2 and SMSQ are two significantly different things, the former being developed on the Atari as a more advanced OS than Qdos, whereas SMSQ was developed for the QXL, to be a Qdos clone. SMSQ very likely went via the Atari to get to the QXL, however. The SMS2 project name given is "Ora". The starting price for the OS on rom is quoted as £99. Remember that it is for the Atari only. One item notably absent from the document on SMS2 is any individual or company name, to identify its source and where to go to get the rom.

(Some of these points have appeared in past QL Scenes after conversations with Miracle Systems and others, but this is the first explanation we have seen quoting a price and project name.)

As is fairly normal for enthusiastic advocates of an enhanced Qdos, space is devoted to "knocking" existing (and highly successful) operating systems - dismissive mention is made of Unix, OS/2, (Windows) NT, Solaris and Mach. The fact that Mach is bracketed with the others suggests some lack of understanding of what it is (a "micro-kernel" which sits between the hardware and operating systems such as NeXTStep). On a more positive note, it is stated that hardware supported includes serial and parallel ports, floppy disk drives and SCSI hard disk drives, ramdisk, keyboard and mouse, MIDI (music) ports, and the Atari display formats 600 x 400 mono and 1000 x 900 4-colour. Facilities provided include advanced multi-tasking, high performance windowing, efficient inter-process communication, easy programming, and "response times better than the fastest real-time systems". That last claim takes some digesting!

Atari emphasis

A bulletin board message lists further project names - SMS3, SMS4, Karona, and Stella - linked to SMS2 and Ora. The slant is heavily towards Atari machines, partly because of the much greater numbers there are of them than of QLs. Whether or not the profusion of names, and the remarkable claims made, lead to anything concrete remains to be seen; the SMS2 as presently used on Atari variants clearly works, but it is not that far away from Qdos in its functionality, surely? Perhaps someone truly familiar with what is currently implemented would care to explain the features that are over-and-above those of Qdos?

In principle, the QL/Qdos user is being offered a path to much better things, rather than the

detail changes that have so far been available through Minerva. Maybe, after the false dawns of projects such as Futura and Thor 20/22 several years ago, we are about to get something real. This is certainly what many users would like. The question is, exactly what is available now? Meanwhile, the Miracle QXL is on the market.

Whichever way you look, it is towards a non-QL host - Atari or PC, with the Amiga a possibility. None of these routes can have a bright commercial future without attracting users from worlds other than the QL one. There are simply too few active QL users to support expensive software and hardware development on a large scale. In view of this, it is surprising that there does not appear to have been any advertising campaign to sell the QXL to PC users, for instance. As with everything in our micro world, it is the software that sells products. Somewhere along the line, users who presently know little or nothing of the QL will have to be told that QL software offers them something they cannot get (at reasonable cost) elsewhere.

Readers' letters

I M Gaye sent in another two disks for checking. This time, both were 3.5-inch DD, and both were bad. No amount of persuasion had any effect on either of them; for a change, it was definitely the disks themselves that were at fault. Gaye made the point that a friend had advised him against cleaning disk drives internally. This is a comment heard fairly often, the basis for it presumably being that disk cleaners can be abrasive and may cause wear to the read/write heads. There may be some justification in this, but I have not so far detected any problem resulting from my own use of disk drive cleaners, and my drives have been cleaned regularly (about once per month) for years. Some cleaners use dry paper, which has the appearance of filters for coffee machines, and this certainly worries me a bit, so I always put a

few drops of isopropyl alcohol on the cleaning disks before using them. This liquid is what is supplied with some commercial cleaning kits, and it can be obtained from chemists' shops; 50 ml is enough to last most users for a lifetime, and that volume cost me all of 46 pence.

Further problems with HD disks have led me - almost - to the conclusion that HD disks should never be given a DD format. Additionally, while DD disks in DD drives have rarely given me trouble, HD disks have given me trouble in both HD and ED drives, when formatted to both DD and HD. Nothing leads me to believe the problems are a function of the disks themselves, though.

Arvid Borretzen sent a hard disk back-up program from Norway, with a request that it be tested, as he does not have a QL with hard disk attached. At the moment, the hard disk is still banished from my QL, but it will be reconnected to test the program (not straight away!). Apologies for using "o" instead of the correct character in the surname, Arvid, but articles go through various filtering processes that will remove any "odd" characters, so there was no point putting the correct character in (an "o" with a "/" through it). (This is as much to do with the way the commercial systems talk to each other as it is to the way the QL talks to them. If I can catch them, they go straight back in again. Editor.) He is leader of a food and water testing laboratory, and says all the software used for the testing work is written in SuperBasic and compiled with Turbo or QLiberator.

The PC question

H F Banks posed the question of what he should spend his money on. He has in mind buying a QXL card, but knows little about PCs and wonders what sort to get to house the QXL. Naturally, he wants to continue using his current QL applications. One piece of advice given to him was to buy the minimum PC necessary to allow the QXL

to function, but he obviously feels that may not be the best thing to do. Initially, he thought that the 8 MB of ram available on the QXL could be shared with the PC, but he has discovered that this is not true; the memory on the QXL, and that in the host PC, are quite separate and neither accesses the other (it seems unlikely they will be able to in future, either). Unless absolute minimum cost is the prime consideration, it would be unwise to buy a "basic minimum" PC. Nothing is cheap for no reason, and a PC costing less than about £500 pounds can be expected to suffer some significant drawbacks, the main one being a hard disk drive unlikely to have greater than 40 MB capacity. Yes, there are - occasionally - bargains to be had from shops selling obsolete stock. Very rarely, you might get a better deal secondhand than new. For most QL users who want to experiment, and do not know the ins and outs of another market, the best thing is to buy new, and not get the bottom-of-the-range model either.

Banks also asked where he could get a cable made up, to connect the TTL/RGB socket of his Philips CM8833 monitor to the QL RGB socket. Try calling Tony Firshman at T F Services.

What an expert!

What is said in program reviews will always be the subject of some argument, and Stanley Hurwitz (I read elsewhere) would like to see articles by a "scrupulously fair-minded software expert", with (is he implying?) no commercial axe to grind. That is, someone who is in no way connected with the QL business. Well, most reviewers have no commercial connection with the QL business anyway. Occasionally we get a bit of free software, but when this happens it is usually either a beta-test version or an upgrade. And if we do get a new piece, then we have to learn it before we review it - there is no certainty that it is something that we will wish to use in our daily work! There is also an idea that we simply

accept what suppliers tell us. Well, we can't report everything that goes on behind the scenes!

To some extent, the wish makes sense, but who, outside of the QL world, would be suitably equipped with knowledge of any QL product to write a sensible review? Let alone a comparative one? You need to use the product for some time to do it justice. Equally importantly, you need to be aware of what the QL is, and has been through, and what else is available on it. If you are a keen reader of reviews in a variety of computer magazines, you will often spot writers who clearly do not normally use the product they are reviewing. In fact, the busy "hack" probably knows well very few of the products written about, in the sense that he or she can not - from sheer shortage of time - get to know more than, say, three or four major programs thoroughly.

Consider the two main word processing programs for the QL, Text87 and Perfection. They are quite unlike each other in many ways, despite doing basically the same job; the instructions for each are comprehensive, and take a long time to digest; both programs have gone through a long string of new versions; both are similar to Quill in certain respects (they are designed to be), leading to the possibility of getting mixed up about which program has which features, or handles a command in a particular way. Reviewers should try to be reasonably impartial, but they will naturally have preferences, and this is likely to show in what is written about programs. The reader has to read between the lines to get the full meaning.

Another sentiment voiced often to QL World and the Quanta newsletter is the desire for articles to be written for the person who is not "computer literate". This is easier said than done; for a technically-knowledgeable person to be able to put him or her self into the shoes of a complete beginner is quite a feat. You never quite make it, however hard you try. It is also slow work. A recent training session for a client who has

virtually no computer knowledge is still clear in my mind; the lady in question, and her husband, spent £1,000 on a system a year ago, and had then been given a single day of training by a "computer expert". After that, they left the system unused, simply because the information supplied with it had not enabled them to get to grips with it, and the trainer had talked "over their heads". Nothing of what she said remained in their minds. Although computer and software suppliers are often very much to blame for not writing their instructions for the type of person who has to read them, the users are as bad, for not making the effort to read what is written. New users want computing to be simple, but, alas, it is not like that. You have to work at it.

A new approach

P H Tanner comes last - not because he wrote the most recent letter, rather the reverse, as his letter arrived in the middle of June. He does not write often, but what he does write takes a lot of digesting, and this latest letter has been re-read more than once. What prompted this missive was my query about who would buy the QXL card. He says he will, and maybe two of them, at that! Having said that, he wonders whether anyone else will buy one, since he considers himself to be such an unusual QL user that he cannot imagine anyone else wanting what he wants. A man who has said, more than once, that he really has no use at all for disk drives is certainly different from most computer users! His QLs are plugged together in a network, and spend their days (and nights) working on a joint project that requires relatively little access to microdrives. They are doing basic computing, akin to what "real" computers used to do, before the advent of micros, word processing etc.

The attraction of the QXL to Tanner stems partly from the fact that he did not feel the need for disk drives, and never bought a disk interface for that

reason. So, no disk drives, no Trump Card and no Gold Card. He feels he saved some money and can now spend it on the QXL. To make the decision easier, he has inherited an old 286 PC, which can be the host machine for a QXL. He envisions the QXL doing the "number crunching" work, with one QL driving a display, another QL being used for word processing, and all of them linked together through the PC. Carrying this integration theme a (large) step further, he thinks of putting two QXL cards into the one PC, sharing the common bus. Then, maybe, a 40 MHz version of the QXL. Not lacking in ambition, is Mr. Tanner! But he may not be that much different to quite a few other potential buyers of the QXL.

INFORMATION

TF Services has moved to:

Holly Corner
Priory Road
Chavey Down
Ascot
Berks SL5 8RL

Tel: 0344 890986.

TROUBLE SHOOTER

QXL - Air Message?

Rumours that Miracle's Stuart Honeyball and TF's Tony Firshman flew to America in June via "Hoover tickets" have been quashed by Stuart. "No such luck!", he says, adding that he hasn't been buying Hoovers recently, either.

Pity such a good story has no substance in it, but if someone of Stuart's capabilities could fly on a cleaning device, we doubt it would be broomstick, or even a Hoover - more likely a Vax!

Back on the ground, Stuart gave QL World the latest position on the **QXL**: "We tell our current customers what the QXL does and doesn't do at the moment," he says, "and as each new version of the software becomes available, the disk goes to QXL owners free of charge. So no-one loses out if they buy now rather than later."

"They'll get a few free floppy disks!" he adds cheerfully.

What about speculation that the QXL will run better on 486 machines than 286s?

"Our software is designed to run on the [generic] 8086," he says. "The size of the processor is not the issue. And it'll run on most BIOSs. There are a few un-solved things where we don't know if it's the BIOS or not, but we're going after those." PC users say that this is nothing new - moving between one "clone" and another often throws up problems caused by small but vital differences in the BIOS, even where the machine is described as "IBM-compatible".

In Memoriam - Ernie Wider, NESQLUG

Peter Hale

Ernie died on May 31, 1993, Memorial Day in the United States, the day we honor those who died in defense of our liberty.

He died of cancer after a long, hard struggle to beat the odds. He beat them - by all accounts by more than five months - because he had things to do.

In the end he was surrounded by his family at home. His daughter, Jennie, called me within the hour.

I write this because he was special to me, but I also write for the Sinclair computer press because the QL was special to him.

In his obituary, after the account of his career and his work with his church, it said that he was president of the New England Sinclair QL Group (NESQLUG).

Ernie rarely ventured outside the Psion suite that came with the QL; half the lines of programming he wrote were dictated over the phone, and he struggled to key in every line of SuperBasic from QL World. But he was the only person I know who had working skills with all four applications.

When he worked with the New England Telephone Company, he fought the trend and made the company get him a Thor. His boss justified it on the grounds that Ernie was more productive with a Thor than any two other employees with IBMs. Besides, Ernie told me, his files were too important to be subject to the viruses and security leaks that plagued the networks at the time.

He was a deeply spiritual man of a faith rarely found in the world today. From the day he learned he had cancer, and even when he learned his odds, he did not fear death. As a youth he had made the nine First Fridays, and knew that if he dies in a state of grace, he would go straight to Heaven. "And that's what life is all about anyway," said Ernie.

He set about putting his affairs in order and teaching his children to use the QL. In February he bought a Gold Card, to aid in that task.

By April he was bedridden, and had the QL moved to his bedside. Each stroke was painful, either from the cancer, the paralysis or the frustration of trying to think through a cloud of painkillers. In the end his son had learned enough to keypunch from dictation.

Ernie did not suffer fools gladly; indeed, he suffered them not at all, himself the least. He never complained that the cancer would cheat him.

Many his age become fixed in their ways and ideas, but he was always open to new ideas.

Several years ago Ernie told me about a financial planning program he was involved in. I bit my tongue, but suggested what I felt was a more appropriate avenue.

At first he resisted the notion and I let it drop. But eighteen months later he had the grace to tell me that not only had he followed up, but had spent some of the profits on an IBM so his wife could take work home from the office.

In consequence, I became privy to and part of his planning.

Ernie was not unlike many people whom I have met through a shared interest in the QL. He differed only in that he was my friend.

Oh, God! Ernest Wider, I miss you.

Peter also wrote: "The last time I wrote, you responded by publishing reference to Ernie, his election and his health. Some of the extra five months he got was due to the affirmation he received in QL World."

QL World is proud to be able to acknowledge people like Ernie Wider who were dedicated to the QL and to the QL community, and thank Peter for his part in it.

Some people say that a computer has no soul, but who's going to tell Ernie to leave his QL at the gates?

OpenChannel

Open Channel is where you have the opportunity to voice your opinions in Sinclair QL World. Whether you want to ask for help with a technical problem, provide somebody with an answer, or just sound off about something which bothers you, write to: Open Channel, QL World, The Blue Barn, Tew Lane, Wootton, Woodstock OX7 1HA.

Compression

In June's Troubleshooter, Richard Kettlewell is incorrect if he thinks that compression archivers (the correct term for "compression/decompression programs") have never made it into the QL world. The latest versions of all popular compression archivers have been ported to Qdos thanks to the high compatibility of the C68 compilation system, coming very close to ANSI standard.

Arc and Unzip were the first archivers available for the QL, already some years ago. With the appearance of C68, many people including myself started porting free programs from other platforms to the QL, and since C programmers are often found to be active in electronic communications, archivers were the first programs that brought C68 to the QL scene. By now, the latest versions of Zoo and Zip can be used on the QL, LHA is represented by LHQ. That means that any archive file with a .zoo, .zip, .lzh or (partly) .arc suffix can be created and melted. Archives created on a QL can be read on other systems without any problems and vice-versa. For the LH-suite of archivers (LHARC, LHA, etc.) the

operating system identification for Qdos is registered in Japan!

Many more programs have found their way into the Qdos scene by being ported with the superb C68 and there is an exciting future. Thanks to the continuing improvements of QL hardware (performance, memory, hard disks), even very large and complex programs, such as interpreters of all kinds, ray-tracers, programmable editors and even TeX are becoming real on the little black box. Admittedly, often the Gold Card or a similar powerful setup (such as the Atari STE with QVME) is required - but you are not investing in a Gold Card, Atari TT with QVME or even the extremely powerful QXL just to get the best of the Psion oldies, but also to run software that you couldn't run previously.

**Franz Herrmann
Ockenfels
Germany**

The C68 compiler is available from most Qdos public domain libraries.

Organiser

I was interested to see the letter from Lawrence Carpenter in 11.6 of QL World. I have been using both the QL and the Psion Organiser XP for business for many years. The only bottleneck in my system is the transfer of data collected during my travels on the XP to my QL on arriving home. I would appreciate any help you can give.

At home I use my QL with Gold Card, ED drives, Magnavox colour monitor, Epson LX-800 and Tandy DMP-137 printers and a Falkenburg keyboard interface with Apex keyboard. The working parts are

mounted in a nice mahogany case! I still prefer Quill for word processing and this is used on a daily basis. Archive is also used daily with the excellent Customer/Supplier database program from RMG Enterprises for statistics. My Organiser XP is used both at home and while travelling throughout Latin America and the Caribbean. It has the very complete LACE program from Beachcomber Software which allows me to handle business data, expenses with currency conversion, phone call timing, etc. Storage is on a 256K Flash Datapack. I use the old Transform Ltd. QL to Organiser program to back up data on the QL disk, but have not been able to get it to transfer data to Archive on the QL.

I look forward to seeing an article about data transfer between the QL and the Organiser in your excellent magazine.

**J Roy Goodall
Belize
Central America**

We will be making enquiries. I'm sure that if anyone else has been performing this useful transfer, they will be keen to share their method with Roy.

Thor help!

Please can anyone help me with the repair of a Thor XVI, which is not sending a proper signal to the monitor. Apart from this, all works well. I will travel a reasonable distance if necessary.

**Brian Richardson
Wallington
Surrey**

Most of the established Thor assistance is on the Continent.

Anyone nearby who can help, please write to Brian c/o QL World.

Blind mice!

I have recently been reading various articles in QL World and Quanta magazine about adding a mouse to a QL system, and I thought my experience in this "connection" would be of interest to some, so I am writing to both magazines.

At the Quanta AGM I bought a serial mouse from W N Richardson (EEC), since I was given the impression it was a straightforward plug-in device. It didn't take long to discover it was not that simple, as the "rat" would not work when connected to SER2 with my printer connected to SER1. It was obviously the common +12V power supply problem which I must say is not stressed very much in the literature supplied.

The professional way of overcoming this problem is to remove the main circuit board and fit an extra 680-ohm resistor in parallel with R10, but this involves making track cuts.

I used the following technique:

1. Disconnect all externals from the machine and remove the top case. Prop it up to remove stress on the ribbon cables and LED wires.

2. Drill a small hole through the back edge of the bottom case just to the right of the SER1 connector (as you look down on the machine).

3. Mount a small 2-way terminal block on the outside of the case, just to the right of the hole.

4. Locate C4 on the circuit board and solder a sort piece of red connecting wire to the positive axial wire of this component. Solder a short piece of black wire to a negative point on the

board. Pass these wires through the hole in the case and connect them to the terminal block. You now have a +12 volt supply external to the machine, capable of energising a small load.

5. Dismantle the D-connector of the short adaptor cable supplied with the mouse and disconnect the positive supply wire (coloured blue on mine) from pin 7. Connect a red wire to the positive terminal on the new block mounted on the QL and thread this wire to the D-connector. Fit a 680-ohm resistor between this wire and pin 7; there is just enough room. Tie back the original positive supply wire and reassemble the connector.

6. Reassemble the QL. This completes the hardware modifications.

7. Now load the software and amend any boot files as instructed and you should find your "rat" is now an all-singing, all-dancing mouse.

Having sorted out this problem in my own way I felt I should warn others of the difficulties involved in using the mouse in SER2. I feel that it is unfair to give misleading ideas about the ease of fitting the Serial Mouse. It is not a straightforward plug-in operation. When I phoned Richardson's to ask for advice they didn't seem to know much about it, and referred me to a third party who confirmed the real problem. So, prospective purchasers be warned, a Serial Mouse will not work on a standard QL with another device connected to SER1 until the machine is modified to provide a separate current-limited +12 volt supply.

Phil Stickley
Weybridge
Surrey

In the June (11.6) QL World, Bryan Davies tested and assessed the effect of the Serial Mouse on the QL's supply, and concluded that operation with a direct serial connection should not overload the supply, but operation with a serial-parallel interface (common in QL systems) would do so, and "appears

to rule out this form of mouse interface ... for many users" unless the recommended 680-ohm resistor is fitted. Bryan also goes into some detail about configuring cables to allow a functional connection between the mouse and a standard QL for DIY purchasers.

W N Richardson (like other hardware retailers) sell a wide range of hardware and they can't be expert on everything!! They do what any responsible dealer does - if they don't know the answer, they refer you to a man who does!

Opinions as to whether Phil's mod is less drastic than adding an internal resistor and cutting tracks will vary - each to his own! Beware of undertaking hardware mods unless you know what you are doing; you do them at your own risk, and may invalidate a warranty or damage the machine. W N Richardson, or someone else, may know a man who can do a mod for you.

Sidewinder

For those who are interested in sideways printing, Dilwyn Jones Computing has recently announced a new program, Sidewinder, which might fit the bill. It can print wide spreadsheets or text in landscape mode on 9-pin and 24-pin printers.

Alternatively, you could consider upgrading to an HP Deskjet printer, which supports landscape printing in three character widths. The printer rotates the characters itself, so there is no need to send a slow graphics dump, and landscape printing is almost as fast as conventional upright "portrait" text output; there's a slight overhead as it scans the entire page rather than the columns where ink is needed, but it's much faster than a graphics dump, not least because the amount of data sent from the QL is much reduced.

You do not need to fiddle with INSTALL or PRINTER.DAT to

sue HP landscape mode. Turn on the printer and press the FONT button four or five times to select 183 or 220 columns respectively. Alter the P and L options in the Abacus DESIGN menu to tell the program the new page size, then PRINT as normal.

Simon N Goodwin
West Midlands

Modems and Hermes

Thanks for the TF Services mentions in recent issues. The reason for the computer in the loo was that I needed earthed US sockets and there were none in the bedroom! I must say, though, the photo was engineered by me.

It was a welcome review of Hermes by someone who uses

and appreciates it. It's only a pity Rich missed the whole reason Hermes was developed in the first place. Hermes can support 19200 bps input and thus run any modem - at least, we and our customers have not yet found one that does not work. All the other features which he praises were added during development, rather than being part of the brief to Laurence.

On another subject, please spread the word about our new address, which is Holly Corner, Priory Road, Chavey Down, Ascot, Berks SL5 8RL Tel. 0344 890986.

Tony Firshman
TF Services
Ascot

I've heard several explanations as to why the computer was in the loo, and several people claiming to set up the photo! But Tone is clearly the power before the Throne.

Editor's notebook

Never fear, Mike Lloyd's back. The New User Guide is on page 23-26 as "usual". In fact, next month is looking good, as his next column's just arrived a little in advance!

The postbag always goes quiet in August as Great Britain's QLers pack their bags and head for the sea (or more likely their back gardens, the way things are with many people - but the principle's the same. No more crouching over keyboards for a week or two, by order). But we have had some welcome letters from readers overseas. Hugh H Howie in particular (his letter arrived this morning) is talking about the vast distances travelled and the "Texan-sized" fairs in the North Americas. No wonder some of the UK traders are looking that way. QLers may be thin on the ground compared to some, but it's a big place.

OpenChannel

EuroXchange

After reading your news about Xchange (QL Scene, QL World II.6) I requested it from Gunther Strube, who sent the disk to me immediately.

I found that Quill and Abacus don't read any kind of files (.doc or .aba) but Archive and Easel seem to work well. I have written to Gunther on this problem.

Then I examined the three utilities, PRinto, Pedit and Replace: Pedit and Replace work well, they can be compiled by Turbo with no problems. I only remarked the line, that has statement SYS_VARS=163840, because SYS_VARS is a Turbo function.

PRinfo doesn't work, apparently because it has some errors during the handling of the serial printer.

The program halts on fields PARITY and PAPER FORMAT, and I must change the lines 2220 FOR loop=1 to 5: READ paritet\$(loop) and 2400 en_til 1,1:PRINT#7,betegnelse\$(38);To 20 (etc.) to read:

```
2220 FOR loop=0 TO 4:
READ paritet$(loop)
2400 en_til 1,1:PRINT#7,betegnelse$(28);To 20 (etc.)
```

because the index of array paritet\$ starts from 0-NONE and finishes to 4-EVEN (1-LOW, 2-HIGH, 3-ODD) and the max value of betegnelse\$ is 28 and not 38.

If the printer is a parallel, it works well.

You must add on line 1140:CLOSE#5 for closing Xchange_dat, which remained open otherwise.

If you have installed Turbo Toolkit, you must remark line 1040 SYS_VARS=163840. You could remark or delete the line 1020 DIM prog_use(40), dat_use\$(40), dev_data\$(40), dev_prog\$(40), because it's a duplicate of line 1000. With the inserting of a few lines and the changing of others, the program can be improved: the filename to examine and the drive from read are requested from console.

The changed lines are:

```
1000 DIM P_tekst$(222), (etc.)
1      2      2      0
OPEN#9,con_300x18a116x202
: (etc.)
1900                                IF
bested=0:PRINT#kanal,!(... Esc -
Quit, Continue - ENTER,
Change=F1 ...)ELSE (etc.)
1940 IF tryk=10 or tryk=27 or
tryk=232: EXIT loop
```

The inserted lines are:

```
1      0      4      5
xchange$="xchange_dat":
REMark this is the default
1425 IF esc_flag=232 :
change_device
1445 IF esc_flag=232 :
change_device
1      7      3      5
p_tekst$=p_tekst$&chr$(10)&"Y
ou can replace device and text
printer name"
2      1      2      5
xchange$="xchange_dat":
REMark restore default and the
new procedure
CHANGE_DEVICE
4000 DEFine Procedure
change_device
4001 LOCAL f$,an$
4002 CLS#9
4003 INPUT#9,"Device : "f$:
REMark ENTER default
4004 IF f$="-" then GO TO
4007
4005 IF f$="-<>'4' then goto
4002: REMark only FLP1 or
FLP2
4006 dev_data$=f$&"_"
4007 CLS#9
4008 INPUT#9,"Driver printer :
",an$
4009 IF an$="-" then GO TO
4012
4010 IF LEN(an$) > 36 then
GO TO 4007
4011 xchange$=an$
4012 vis_pdriver
4013 PRINT#7,p_tekst$
4014 vent 9,0
4015 END DEFine
change_device
```

Gian Paolo Marcolongo
Cesena
Italy

This version of Xchange is not identical with the one that Simon Goodwin described in QL World II.7 last month, which is becoming available from UK public

domain libraries.

Thank you to Gian, who also takes the biscuit for the faintest printer ribbon of the year so far!

Long distance

I enclose a report on my visit to the Newport fest in June. mention the feasibility of a fest here next year. This is off the top of my head, and I do not know if I can get the club (the Toronto Timex-Sinclair Users Club of Canada) to go along with me. The first step is to get some feedback.

I will be attending an AI Formats Computer Show in Dayton, Ohio at the end of August. A number of Sinclair clubs will be in attendance, and from that I should be able to get a feeling as to how many might attend a fest here.

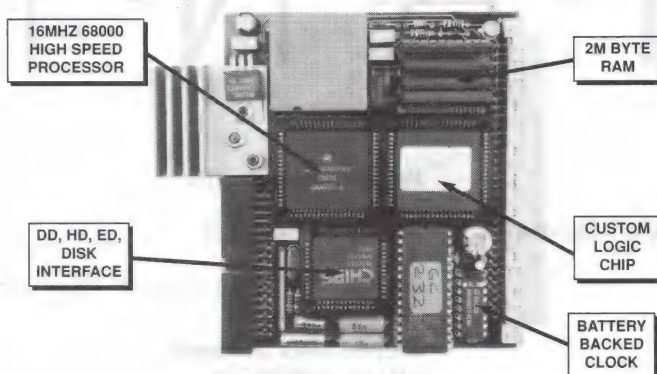
Incidentally, this show in Dayton is the largest in the Midwest USA, and had an attendance of 27,500 last year. I covers just about every computer in use, with flea markets and traders all over the place, over 100 traders, the lot! Oh that we had a Sinclair fraternity like that. But at least "Sinclair" will be there.

My travelling distance to Newport was about 600 miles and my distance to Dayton is about 450 miles, so we do travel long distances where our hobby is concerned.

Hugh H Howie
Burlington
Ontario
Canada

Thank you for the subscription Hugh. This letter arrived just as we were going to press, so look out for Hugh's report next month.

MIRACLE SYSTEMS



QL GOLD CARD

£225 inc. (£200 outside EC)

This is the expansion that has been revolutionising the QL. It is very easy to fit - it simply plugs into the expansion port at the left hand of the QL - and once fitted it will instantly increase the execution speed of the QL by about 4 times due to the presence of a 16MHz 68000 on board. There is 2M of fast 16 bit RAM of which QDOS sees a contiguous 1920K. The remainder is used for shadowing the QL's ROM and display memory and for the GOLD CARD's own code.

There is a disk interface which can access 3 mechanisms (4 with the DISK ADAPTER) of 3 different densities, DD (double density, 720K), HD (high density, 1.44M) and ED (extra high density, 3.2M) in any mix. The disk interface connector is the same type that was fitted to the TRUMP CARD so most QL compatible disk drives can be used. Please note that DD drives still give a capacity of 720K per diskette. Our DUAL ED DISK DRIVE allows the GOLD CARD to access DD, HD and ED diskettes.

Another feature is the battery backed clock. When the QL is switched on the contents of the clock are copied into the QL's clock so that the time and date are correct. The firmware in the ROM gives the GOLD CARD all the functionality of the TRUMP CARD like TOOLKIT II and there is a sub-directory system for floppy and RAM disks.

Physically the GOLD CARD is about half the size of the TRUMP CARD and so fits almost all within the QL. Its current consumption is well under the allowable maximum so no special power supply is required. The GOLD CARD comes with a 14 day money back guarantee and a 2 year warranty.

See the QXL at:

Saturday 4 September 1993
Georgian House Hotel
Manchester Road
Blackrod, nr. BOLTON

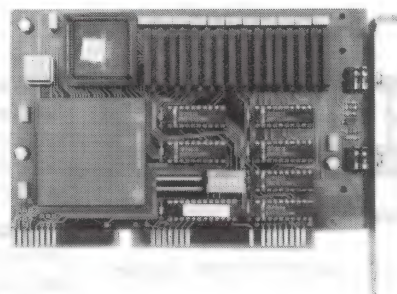
Sunday 19 September 1993
Village Hall
Gore Road
Rayne, Braintree, ESSEX

Tel: (0904) 423986

To place an order by phone please have your credit card ready. For overseas customers we charge the prices shown in brackets.

To order by post, please fill in the form opposite or write to us quoting your credit card number and expiry date, or enclosing a cheque payable to MIRACLE SYSTEMS Ltd.

THE QXL



The QXL turns the common PC into a QL compatible. The package comprises a half card that plugs into an 8 or 16 bit standard ISA slot and a diskette loaded with a QDOS compatible operating system and a Superbasic compatible interpreter. After installation simply type QXL and the PC will appear to be a QL allowing QL programs to be run from QL format diskettes.

The card itself has a 32 bit 68EC040 processor running at 20MHz which gives a good turn of speed. This processor has access to its own RAM and so performance is virtually independent of the host PC whether it has an 8088 or a Pentium. In fact the PC is used purely as an I/O system giving QL programs access to the PC's floppy disc, hard disc, keyboard, display, serial and parallel ports. The card itself has QL style network ports to allow connection to a QL network. The minimum PC specification required is an XT with EGA display and a spare standard slot.

Varying RAM sizes from 1M up to 8M can be supplied. The smaller capacities can be upgraded to the larger ones and the cost is simply the price difference. Not all the RAM is available to the user programs; the 1M equates roughly with a TRUMP CARD QL memory size and the 2M with a GOLD CARD QL.

During the lifetime of the QXL we intend to enhance the software to make use of the new hardware facilities of the PC such as SVGA graphics. As has been our policy with the TRUMP CARD and GOLD CARD we intend to provide software upgrades free of charge.

QXL prices

1M	£295	(£255)
2M	£325	(£280)
5M	£410	(£355)
8M	£495	(£430)

(prices in brackets for outside EC)

INTERNATIONAL QL REPORT (IQLR) is a regular magazine that all QL users should read. It has articles for the beginner, the advanced user and every one else in between. Also, the international flavour combined with low advertising rates makes it probably the best place to locate QL related items. IQLR is run by QL enthusiasts whose proud boast is that they have never been late with an issue. If you do not already get it then 'phone us now. One year's subscription for 6 issues to any European address is £22.00 and it's worth every penny. Subscribers elsewhere should contact SeaCoast Services, 15 Kilburn Court, Newport, RI 02840, U.S.A. direct.



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Complete QL systems, monitors, keyboards and interfaces, disk drives and printers, peripherals.

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Roms, mdvs, spares, PD software.

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Subscriptions, binders, recent backissues.

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User group, support, library.

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COWO Electronic

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QTop, Atari QL emulator, Thor support

Deltasoft

7 Tyrell Way, Stoke Gifford, Bristol.

FlightDeck, Image D, AMD Airplan

Digital Precision

081 527 5493

Perfection, PC Conqueror, Lightning, Professional Publisher, Eye-Q, Solution, Spellchecker, The Editor, Media Manager, Professional Astrologer, QMaths, CPort, and others.

DJW Software

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Discover, Textidy, QL-PC Fileserver, Fleet Tactical Command, Basic Reporter, QLiberator, Filemaster, The Gopher, The Painter, Flashback, DataDesign, QPAC2 and other Pointer Environment programs, others.

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081 291 3751

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010 39 342 492323

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ZM-X ZX Spectrum emulator, Open World, other QL software.

Jochen Merz Software

010 49 203501274

(Germany)

QL/Atari emulators, QSpread, File Finder, QPTR Pointer Environment Toolkit and other PE programs, QDesign 2, various games, and others.

Lear Data Systems

6 Southview Green, Bentley, Ipswich, Suffolk IP9 2DR.

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Pointer Products

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Text87 Plus4, Publishers' Pack.

TF Services

071 724 9053

Qualsoft QL Terminal Emulator, File Transfer.

WD Software

0534 81392

Notes:

Addresses only given where there is no business line. For Fax numbers, phone dealer or check ad. in QL World. Only larger dealers have Fax, often on the same number. Some numbers no longer active in the QL world are given for reference and support queries.

Merz updates and bug-fixes

Jochen Merz Software are forging ahead with their regular software updates. The **QVME** QL Emulator can now even run "badly written or old software which writes directly to the QL screen, which is usually located at address 131072." Old games and graphics programs can be run on the emulator in this way: all programs open the windows in an "old" screen area, where "direct dirty accesses" are done. The lot is then copied a number of times per second to the "real" screen memory on the QVME card automatically by the Atari Blitter custom chip, and interleaved with the processor, so that copying does not slow the machine down much.

All advanced programs used the screen driver, so in most cases this "compatibility mode" will not be needed, but it's a help for fans of older software. Updates are free, and a new V6.4 manual is recommended. The QVME now runs on the 68030 Atari TT, with a fast floating point chip 68882, both running at 32 MHz. The TT version has the same features as the Mega STE versions, supports the same devices, including hard disks, and costs the same.

On the software front, **Menu Extension** has a new menu called Character Select, which allows character generation via a table. QD's integrated **Help** system has been improved again, with short-cut key-strokes and a DO to toggle window sizes. V5.00 owners get a free upgrade.

MenuConfig V1.18 has now fixed some bugs that crept in with upgrades in V1.14. Brainsmasher owners can get a free upgrade by sending their master disks back to Jochen. The popular QSpread is up to version 1.17 with many new features in this upgrade - number-to-text conversion (for printing on cheques, etc.), Find, extended grid modification commands including adjustment of cell references when rows and columns are added or removed. Merz reckon QSpread has been prettywell bug-free since version 1.15, and recommends owners of 1.12 or earlier to get a free software update and order a new manual from the company while they are at it.

Jochen Merz Software is, as ever, at **Im Stillen Winkel 12, D-47169 Duisberg, Germany**. Take a note of their German postcode for your address books.

Quanta trade charges

Quanta has decided to charge traders at its Workshops £30 on the door, or £20 if booked in advance, for trade stands. Developers who wish to exhibit but not sell products will be free of charge. A registration form with full requirements, including power points, is available from **Phil Jones, 66 Devonshire Avenue, Long Eaton, Nottingham NG10 2EP**.

The next Workshop is at Bristol Walton Park Hotel, Wellington Terrace, Clevedon, Avon on 17th October 1993.

The Bristol workshops have a popular reputation with traders and the public.

ALL FORMATS DIARY

Coming dates for the **All Formats Computer Fair** are:

August: no dates listed; Sep West Midlands National Motorcycle Museum, junction 6 of the M42; 12 Sep Brighton Corn Exchange, Church St, Brighton 18 Sep Leicester De Montfort Hall, Granville St, Leicester 19 North East Washington Leisure Centre, Dist 1 25 Sep Edinburgh Adam House, Chambers St 26 Sep Glasgow Mitchell Theatre, Granville Road. (Next Novotel, Hammersmith Fair is on October 23rd.)

Check with suppliers whether they will be at a particular Fair. If you have far to travel phone All Formats 0608 663820 to check arrangements haven't changed.

Day tickets are £4; attendees can get up to 50 £1-off vouchers by sending an SAE to the organisers at Maple Leaf, Stretton-on-Fosse, Moreton-in March, Gloucestershire GL56 9QX. (Only one voucher per ticket.) Photocopies of these vouchers are also accepted. Admission to the Fairs is a flat £2 between 2pm and 4pm (£1-off vouchers do not apply at these times).

Silver Service

With software service companies in the PC-compatible sector now charging hundreds or even thousands of pounds for software support after a limited initial period of ownership (This is Help-desk support we're talking about. Upgrades are a different story again.), Freddie of Digital Precision has been heard to mutter that DP provides software support free and for an indefinite period for its customers.

In fact, you can rely on the vast majority of QL suppliers now in the business to help out with any problems you may have while using their products wherever they can. There are some real benefits in being with the QL.

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DIY TOOLKIT

Three versatile file-handling SuperBasic extensions join Simon Goodwin's DIY Toolkit.

THE latest arrivals are file-handling extensions: the INPUT\$ and ANYOPEN% functions, and the SET_POS command.

These extensions make direct calls to the QL operating system, permitting access to any file, new or old, including the Qdos directory hidden on every file-structured device. They let you move to any point in a file without traversing the intervening bytes, and read up to 32K at one gulp.

These are very useful, but simpler than recent DIY Toolkit projects, and may serve as an introduction to budding assembler programmers.

INPUT\$

INPUT\$ is a function to read a sequence of bytes from a file in one step. It takes two parameters - the number of an open SuperBasic channel, and a positive integer length. The function is present in **Microsoft Basic** and **Turbo Toolkit**, but it does not appear in QL roms, which is a shame as it is many times faster than the official alternative, repeated calls to INKEY\$.

INPUT\$ can swallow up to 32767 bytes in one mouthful. I use it on the Speculator file converters, which convert 48K snapshots of Spectrum memory from PC and Amiga to QL format. Snapshot files consist of a 48K memory image, plus extra information about the state of the processor and emulator. This extra information may appear at the start or end of the file, and its format varies between emulators.

INPUT\$ is an efficient way to move the main body of the file from one format to another. Even reading a modest 1024 bytes at a time, INPUT\$ is about 20 times faster than INKEY\$. This makes a real dif-

ference, even on a Gold Card, where snapshot conversion takes under ten seconds with INPUT\$ and more than three minutes with INKEY\$.

INPUT\$ is also a good way to read the 64 byte entry for each file in a Qdos directory. The Toolkit 2 string GET operation is not suitable in such cases, as it relies on a positive length word at the start of each string, and this will not appear in real binary data.

INPUT\$ is the most general way to read data into a string; it can deputise for string GET as long as you use INPUT\$(#chan,2) or GET #chan,len% to find the length before you read the string text.

SET_POS

SET_POS is a simple command to set the file pointer. As a file is read or written Qdos keeps track of the next byte to be transferred with a 'file pointer' - a long integer value between zero and the number of bytes in the file. When it is zero it is at the start of the file, so SET_POS #3,0 rewinds the file pointer to the start. This is useful if you have just written a file with OPEN_NEW or OPEN_OVER and wish to read it from the start without re-opening it.

Likewise, you can extend an existing file by opening it in the usual way with OPEN and moving the pointer to the end before you add new data. If you attempt to SET_POS past the end of the file, Qdos rounds the position down to the last valid position, so SET_POS #3,1E6 will reliably find the end of a file up to a million bytes long. The QL microdrive handler has a 24 bit limit on pointer position, so attempts to SET_POS beyond about 16,777,000 will cause a 'bad medium' error.

```
* QL WORLD DIY TOOLKIT - GENERAL-PURPOSE CHANNEL EXTENSIONS
* Version 0.7, Copyright 1993 Simon N Goodwin.
*
start      lea      define,a1
           move.w   $110.w,a2      BP.INIT vector
           jmp      (a2)

* result% = ANYOPEN% ( name$, mode% )
*
anyopen     lea      16(a3),a4
           cmpa.l   a4,a5          Two parameters please
           bne      bad_param
           addq.l   #8,a3          Get integer mode first
           movea.w  $112.w,a2      Vector to get an integer
           jsr      (a2)
           bne.s    bad_exit
           move.l   a1,d7          Save RI pointer for later
           move.w   0(a1,a6.1),d5  Save open mode for later
           subq.l   #8,a3
           subq.l   #8,a5          Recover first parameter
           movea.w  $116.w,a2      Vector to get a string
           jsr      (a2)
           bne.s    bad_exit

*
* Attempt to open a channel using the string on the RI stack
*
           move.w   d5,d3          Restore Open mode
           ext.l    d3             Take nothing for granted
           movea.l  a1,a0          Point A0 at the string
           moveq    #-1,d1         Owner is this task
           moveq    #1,d0          IO.OPEN trap key
           trap     #4             A0 is A6-relative
           trap     #2             Try it!
           tst.l    d0
           bne.s    return_d0

*
* It worked, find space for it in BASIC's channel table
*
           movea.l  $30(a6),a2     Table entry size
           moveq    #40,d1         Past the end?
scan_chans  cmpa.l  $34(a6),a2
           bge.s    make_room
           tst.b    0(a2,a6.1)     Is it free?
           bmi.s    found_room
           adda.l   d1,a2          Try the next slot
           addq.w   #1,d0          D0 is channel number
           bra.s    scan_chans

*
make_room   move.w  d0,d6          Save BASIC # for later
           movea.w  $11a.w,a2      Fetch base vector
           lea      44(a2),a2      Adjust for channels
           jsr      (a2)
           movea.l  $34(a6),a2     Point at BV.CHP
           lea      40(a2),a3      Move up one entry
           move.l   a3,$34(a6)     Claim the new one
           move.w   d6,d0          Restore BASIC #

*
* Store channel ID and initialise BASIC channel details
*
found_room  move.l  a0,0(a2,a6.1)
           moveq    #7,d1          Count for 32 bytes
```

You can move the pointer on most systems (apart from some Thor XVI and Minerva roms) with undocumented calls to PAN and SCROLL, documented in QL World February 1989, but this is obscure and complicated for long files, as those commands limit moves to 32K at a time. SET_POS is included here as it is an interesting example and a useful complement to INPUT\$.

Both routines

SET_POS and INPUT\$ are ideal for use when reading sectors from a disk. Use SET_POS and PRINT; to write

sectors back. They can also be used to get around a bug in early QL roms, which limit INPUT lines to 128 characters. AH and JM roms report a 'buffer full' error if you try to read longer lines.

If you use INPUT\$ to read groups of characters the 128 byte limit is ignored. The approach is to read groups of bytes, building up a long string, until the CHR\$(10) marker at the end of the line is found with INSTR.

At this stage you discard the rest of the string and use SET_POS to wind back to the character after the CHR\$(10), ready to read the next line.

Your program needs to keep track of the number of bytes read so far, but this is little trouble, as it corresponds to the number of lines read and their total length.

ate a new channel table entry. The method was introduced in my February 1992 QL World column, and is reliable on all known QL roms and emulators. The method can be used in

```
clear_table addq.l #4,a2
clr.l 0(a2,a6.1) Initialise turtle etc.
dbra d1,clear_table
move.b #80,3(a2,a6.1) Fix default WIDTH

*
return_d0 move.l d7,$58(a6) Update BV.RIP
move.w d0,0(a6,d7.1) Stack the result
moveq #3,d4 Type = 16 bit Integer
moveq #0,d0 No run-time error
rts

*
bad_param moveq #-15,d0 BAD PARAMETER error
bad_exit rts
*
* result$ = INPUT$( # channel$ , bytes$ )
*
* Read and check both parameters: channel number & length
*
inbytes movea.w $112.w,a2 Vector to get integers
jsr (a2)
bne.s bad_exit
subq.w #2,d3 Two parameters?
bne.s bad_param
move.w 0(a1,a6.1),d0 Channel number
bsr.s get_qdos_id Convert BASIC # to ID
move.w 2(a1,a6.1),d5 Bytes to be read
ble.s bad_param
addq.l #4,$58(a6) Unstack two integers

*
* Make room to read the string onto the RI stack
*
ext.l d5
move.l d5,d1 D1 is space needed
addq.l #2,d1 Allow length word
move.w $11A.w,a2 Find BV.CHRIX
jsr (a2) Allocate RI space
movea.l $58(a6),a1 Get BV.RIP
suba.l d5,a1 Move it down
bstst #0,d5 Is the length odd?
beq.s its_even
subq.l #1,a1 Ensure a word boundary

*
* Fetch the string from the file to the RI stack
*
its_even moveq #-1,d3 Indefinite timeout
move.l d5,d2 D2 is length in bytes
trap #4 A1 is relative to A6
moveq #3,d0 IO.FSTRG key
trap #3
tst.l d0 Did it work?
bne.s bad_exit
suba.l d5,a1 Wind back over the text
subq.l #2,a1 Allow for 'a prefix word
move.w d1,0(a1,a6.1) Set string length
move.l a1,$58(a6) Set BV.RIP
moveq #1,d4 Indicate string result
rts
```

ANYOPEN%

ANYOPEN% is complementary to QTRAP, BTRAP and MTRAP, from DIY Toolkit Volume T; it lets you pass any string to the Qdos OPEN trap, TRAP #2 with D0 set to one. The function either returns the negative Qdos error code, or a positive number to indicate the new channel available to SuperBasic.

Many DIY Toolkit extensions include code to look through the SuperBasic channel table, but this is the first that can cre-

ate any extension that needs to open a file and make it available to Basic. I didn't know how to do this when I wrote the Turbo Toolkit CONNECT command, which is why the output pipe channel number is required to be lower than the input one!

ANYOPEN% takes two parameters - a string and an open-type, as documented on page 40 of Andrew Pennell's **Qdos Companion**. Type zero is used to open an existing file or device for reading and writing, like the normal OPEN. Type 1 corresponds to OPEN_IN, creating a read-only channel. Type

2 is OPEN_NEW, while types 3 and 4 match the Toolkit 2 commands OPEN_OVER and OPEN_DIR.

Original Sinclair JM and AH roms do not support type 3 on microdrive, but type 3 is fully implemented by Toolkit 2 as well as Minerva, JS and MG roms. If your code must run on all QLs you can simulate a type 3 OPEN with a simple sequence. If ANYOPEN%(FILE\$,1) works, CLOSE the file, DELETE it and try again with ANYOPEN%(FILE\$,2).

Error messages

If ANYOPEN% fails it returns a negative Qdos error code to indicate what went wrong. The values are listed in most QL books. Pages 19 and 20 of the QL User Guide (December 1984 update) give the codes and their meanings, although the list confusingly uses positive rather than negative numbers.

At first sight ANYOPEN% might look a dead ringer for QJump's FOP_ functions, but I have found it more useful for

checking devices because it does not try to prepend a default prefix if the name is initially rejected.

I have found it almost impossible to detect a missing drive with FOP_DIR on a Gold Card, because any reference to, say, MDV1_ is converted to FLP1_MDV1_ if your default is FLP1_, and FOP_DIR happily opens the floppy directory without indicating the absence of MDV1_. The default prefixes in Toolkit 2 are often convenient, but not in this case. If you really need to know if a directory exists, ANYOPEN% is less sophisticated, and more useful.

ANYOPEN% with parameter 2 is similar to the original DEVICE_STATUS%, part of the Supercharge toolkit. The Turbo Toolkit function of the same name is much more powerful, but it will not allow access to directories, and can cause delays and 'bad or changed medium' messages if you use it to check the status of a name on a write-protected microdrive.

The only way to be sure that a medium can be written is to

```
*
* SET_POS # channel , position
*
* Moves to start or EOF if 32 bit position is beyond file end
*
setpos movea.w $118.w,a2 Vector gets addresses
jsr (a2)
bne.s bad_exit
subq.w #2,d3 Test for two parameters
bne.s bad_param Reject otherwise
move.l 0(a1,a6.1),d0
bsr.s get_qdos_id

*
* Set FS.POSAB registers and exit via QDOS TRAP handler
*
moveq #-1,d3 Wait as long as it takes
move.l 4(a1,a6.1),d1
moveq #542,d0 Set the trap key
trap #3 Call FS.POSAB
rts Return D0 error, if any

*
* Convert channel number in D0 to channel ID in A0
*
get_qdos_id mulu #40,d0 Scale for table size
bmi.s what_chan Channel numbers start at 0
add.l $30(a6),d0 Add table base offset
cmp.l $34(a6),d0
bge.s what_chan Past end of table?
move.l 0(a6,d0.1),d0 Fetch ID from table
bmi.s what_chan Channel closed if negative
movea.l d0,a0
rts

*
what_chan addq.l #4,a7 Return to prior caller
moveq #-6,d0 CHANNEL NOT OPEN error
rts

*
define dc.w 1 One procedure
dc.w setpos-* # channel$ , position
dc.b 7,'SET_POS'
dc.w 0
dc.w 2 Two functions
dc.w inbytes-* ( # channel$ , bytes$ )
dc.b 6,'INPUT$( # channel$ , bytes$ )'
dc.w anyopen-* ( name$ , mode$ )
dc.b 8,'ANYOPEN%'
dc.w 0

*
end
```


try to write to it; there is no error when you open the file, even if it is 'in use' or 'read-only'. `DEVICE_STATUS%` with the 'try everything' -1 option attempts to re-write the first byte of an existing file. This works fine with disks, but the microdrive handler does not detect the missing tag. It repeatedly tries to write the sector, but the drive observes the write-protection and stubbornly refuses to play along, leading to the dreaded report a minute or so later. Don't panic - your data is intact.

`ANYOPEN%` does not try to write when it opens an existing file, so the error comes only when the user tries to re-write the file. This is not the ideal solution, but it's the best we can do without fixing the hardware.

SuperBasic checks

You can avoid most problems if you perform extra SuperBasic checks when you know you are not using a microdrive - a STAT report over 250 sectors is a reliable indication, and could be used in conjunction with a device prefix check and - Qdos willing - tests on system variables like `SV.MDRUN`.

Loading and GoingTo use these extensions you must either type in one of the listings, or obtain the equivalent on tape or disk by post from DIY Toolkit. Listing one is assembler source, tested with QL Devpac 2.0, while Listing two is a SuperBasic loader for corresponding hex data.

When you type in and run Listing two it checks the data and creates a small code file on any device you choose. Once you have created `FLP1_ACCESS_CODE` you can link the function to SuperBasic with these commands:

```
X=RESPR(342)LBYTES
FLP1_ACCESS_CODE,XCALL X
```

Source and binary code for these extensions has been added to DIY Toolkit Volume E, where they join `PURGE`, the

string select function `PICK$`, and the error trappers `CHECK%` and `CHECKF`.

24 volumes of DIY Toolkit goodies are now available on disk and microdrive, priced at £3 each on 3.5 or 5.25 inch Qdos disks, or £4 per volume on cartridge. Full instructions and technical notes come on the drive, in Quill .DOC format; order two or more volumes and you get laser-printed documentation for each volume at no extra charge. To obtain volumes, or further information, write to the DIY Toolkit librarian Dr. Bill Fuggle at DIY Toolkit, 86 Lordswood Road, Harborne, Birmingham B17 9BY, UK.

For an example of `INPUT$` and `ANYOPEN%`, see this month's SuperBasic in Action. I shall continue by discussing Listing one, which should already be quite clear from the comments alongside the code. The code is re-entrant and 'romable'. It has been tested on Gold Card JM and Amiga JS Qdos systems.

How it works

The `START` routine is only used when you first `CALL` the code. It links the new names at the end of the file to SuperBasic.

The assembly code for `ANY-OPEN%` comes next. It reads the second parameter (the open-type) first, to find out the value of `A1` that corresponds to a single integer on the stack, and copies this to `D7` as it will come in handy later.

The next call fetches a string onto the maths stack, and passes it to `TRAP #2`, trying to open it. If `D0` is not zero after this, the error code is returned to Basic in the space previously reserved for the open-type. The string is discarded as `BV.RIP` points past it when the function returns.

If the `OPEN` succeeds the program looks for a space in the SuperBasic channel table. Empty slots have a negative value in the first byte, and can be re-used.

If all slots are in use execution continues at `MAKE_ROOM`. Until last year

```
100 REMark Sinclair QL World HEX LOADER v 3
110 REMark by Marcus Jeffery & Simon N Goodwin
120 :
130 CLS: RESTORE : READ space: start=RESPR(space)
140 PRINT "Loading Hex...": HEX_LOAD start
150 INPUT "Save to file...":f$
160 SBYTES f$,start,byte : STOP
170 :
180 Define Function DECIMAL(x)
190 RETURN CODE(h$(x))-48-7*(h$(x)>"9")
200 END Define DECIMAL
210 :
220 Define PROCEDURE HEX_LOAD(start)
230 byte = 0 : checksum = 0
240 REPEAT load_hex_digits
250 READ h$
260 IF h$="" : EXIT load_hex_digits
270 IF LEN(h$) MOD 2
280 PRINT"Odd number of hex digits in: ";h$
290 STOP
300 END IF
310 FOR b = 1 TO LEN(h$) STEP 2
320 hb = DECIMAL(b) : lb = DECIMAL(b+1)
330 IF hb<0 OR hb>15 OR lb<0 OR lb>15
340 PRINT"Illegal hex digit in: ";h$ : STOP
350 END IF
360 POKE start+byte,16*hb+lb
370 checksum = checksum + 16*hb + lb
380 byte = byte + 1
390 END FOR b
400 END REPEAT load_hex_digits
410 READ check
420 IF check <> checksum
430 PRINT "Checksum incorrect. Recheck data.":STOP
440 END IF
450 PRINT "Checksum correct, data entered at: ";start
460 END Define HEX_LOAD
470 :
480 REMark Space requirements for the machine code
490 DATA 342
500 :
510 REMark Machine code data
520 DATA "43FA012C34780110","4ED249E80010BBCC"
530 DATA "66000086508B3478","01124E92667C2E09"
540 DATA "3A31E300518B518D","347801164E92666A"
550 DATA "360548C3204972FF","70014E444E424A80"
560 DATA "6648246E00307228","B5EE00346C0C4A32"
570 DATA "E8006B20D5C5240","60EE3C003478011A"
580 DATA "45EA002C4E92246E","003447EA00282D4B"
590 DATA "003430062588E800","7207588A42B2E800"
600 DATA "51C9FF8F815BC0050","E8032D4700583D80"
610 DATA "7809780370004E75","70F14E7534780112"
620 DATA "4E9266F6554366F0","3031E80061603A31"
630 DATA "E8026FE458AE0058","48C5220554813478"
640 DATA "011A4E92226E0058","93C5080500006702"
650 DATA "538976FF24054E44","70034E434A8066BA"
660 DATA "93C555893381E800","2D49005878014E75"
670 DATA "347801184E9266A2","5534669C2031E800"
680 DATA "610C76FF2231E804","70424E434E75C0FC"
690 DATA "00286B14D0AE0030","B0AE00346C0A2036"
700 DATA "08006B0420404E75","588F70FA4E750001"
710 DATA "FFC0075345545F50","4F5300000002FF5E"
720 DATA "06494E5055542400","FEC208414E594F50"
730 DATA "454E25000000","*",29540
```

there was no documented way to expand the SuperBasic channel table. This is the first demonstration of the required technique in assembly code.

It fetches the value of the vector `BV.CHRIX`, which points to one of a sequence of memory-allocation routines, and adds an offset to manipulate the channel table routine instead of the `RI` stack one. This offset of 52 is guaranteed on all Qdos systems, as Tony Tebby uses it, and has told Laurence Reeves and David Oliver about it; Amiga Qdos developer Mark J Swift can be relied on not to change things like that.

Keep it tidy!

The new 40-byte entry could contain anything when you get it, so the program stores the

channel ID followed by 31 zero bytes which reset the print and graphics positions. The odd byte holds 80, the default `WIDTH`; if this is zero 'division by zero' exceptions will occur when you use fancy separators like `"TO"`, `"`, and `"!` to `PRINT` through the channel anywhere but the screen.

The main challenge in `INPUT$` is keeping the `RI` stack tidy. Thankfully you do not have to worry about this in resident procedures and functions that fail, but functions that return without error **MUST** ensure that the result is the only thing on the `RI` stack when they've finished. The `RI` stack is often held in `A1`, but the official value is `BV.RIP`, a long word at `$58(a6)` in the SuperBasic memory area. Use `BPEEK_L(88)` to read this from SuperBasic.

INPUT\$ reads two integer parameters onto the stack, then checks them, before allocating enough extra space for the text and a prefix length, on an even word boundary. It calls BV.CHRIX vector to check there's enough room, then uses TRAP #3 and IO.FSTRG to read the string direct from the device to SuperBasic memory. The TRAP #4 warns Qdos that the string address is relative to the start of SuperBasic.

SET_POS uses just twelve instructions, plus a call to the subroutine it shares with INBYTES, GET_QDOS_ID. This

attempts to convert an integer SuperBasic channel number in D0 into a channel ID in A0. If anything goes wrong it scraps the last return address with ADDQ.L #4,A7 and returns error code -6 (channel not open) directly to Basic, so there is no need for calls to check D0 on return.

SET_POS reads its parameters with a single call for two long integers. It saves time and space if you let Qdos coerce the integer channel number to a long word, rather than make two vectored calls: one for the integer and another for the long word.

TABLE - ANYOPEN% report codes

- >=0: new SuperBasic channel number available for use
- 3: out of memory - are you still running a 128K QL?
- 6: no room for a new channel; over 360 open (or 168 in 128K).
- 7: the device name was not recognised
- 8: the file already exists (after open-type 2)
- 9: the file or device is already exclusively opened
- 11: there's no room for the new file on the disk
- 12: faulty device parameters, or too long a file-name.
- 16: a euphemism for the dreaded 'bad or changed medium'
- 20: read-only - the drive or file is write-protected

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SJPD Identified

SJPD **public domain software** and shareware have added the following new disks to their library:

SJS 60 - a disk of text files discussing UFO phenomena; SJS 61 **Xtricator** 1.40 ZX81 emulator for the QL by Carlo Delhez, along with some ZX81 public domain software; SJS 62 **DBAS**, a programmable database replacement for Archive (it says here), by David Howells; SJS 63 **Graphiste**, a drawing program from France, translated into English for SJPD Software by Tony Burns.

The following disks have been updated: SJS9 **Molecular Graphics** V5.11, now Gold Card compatible; SJS 52 **DJW demo** disk.

All SJS disks are £1.75 inclusive of media and return postage, or £1.00 copy charge where user supplies medium and adequate postage.

SJPD also has a list of **PC shareware** under the PCPD label, including PCPD 2 QL-PC, two utilities, one to aid transfer of QL files to the PC, and one to aid the PC to view QL screens. PCPD disks are available on 3.5-in disks only, and are £1.75 each fully inclusive.

You can get SJPD's catalogue either in printed form (4 x 24p stamps) or fully up to date on disk in return for a formatted disk, postage and adhesive address label.

SJPD, 36 Eldwick St., Burnley, Lancs BB10 3DZ.

Review rises again

QReview is the new QL magazine by Bruch Nicholls of **Quo Vadis Design**. QReview is the successor to QL Technical Review and QL Leisure Review, the periodicals that Bruce used to produce for CGH Services.

Following very much in the style of its predecessors, QReview has a look at data transfer between computers, Printermaster, Super Disk Labeller, Adventure Playtime and the Pointer Environment. There is also a report from the International QL Meeting in Eindhoven in February, and some other items, including a list of the best-known QL suppliers, a news page, a questionnaire and order form for previous issues of QLTR and QLLR, and a competition for programmers to win a copy of Perfection.

With 36 A4 pages of clear print, QReview Volume 1 Issue one is going for £2 in the UK, £2.50 in the rest of Europe, and £3.00 elsewhere. **Contact Bruce Nicholls, 57 Shaftesbury Road, Romford, Essex RM1 2QL.**

All is not equal

In the 11.7 issue of **QL World**, and to a smaller extent in earlier issues, in some places the "equals sign" in equations has printed out as a "fat minus sign" in the text. In most cases it is fairly clear that this is a print fault, but if you are confused by a "minus" term, or find that it does not run, and the "minus" looks unusually black, try replacing the "minus" with an "equals" sign. We'll get rid of the fault as soon as we can.

Quanta Raynes, OK

The Quanta **Essex Workshop** will be held at the Rayne Village Hall (opposite the Swan pub), Gore Road, Rayne, Braintree, Essex, from 10 am to 6pm, on Sunday 19 September. All QL users welcome, say Quanta: refreshments, demonstrations, talks. Contact **0376 347852** for more information.

Mersey Man Dies

After the **Mersey Mouse** was mentioned in the June QL World, Ron Watson of the QL Mersey User Group contacted us with current details of the Mersey Mouse.

Sadly, since then QLMUG secretary and mouse team-leader Don James has died. "Don, who was a founder member and Secretary of the QL Mersey User Group, will be greatly missed by his wife Bett and family, and all of his friends in the QL world, especially those in the QLMUG," writes Ron. Don spoke to us from time to time about QLMUG and the Mersey Mouse, and was a real enthusiast and pillar of his community.

It is too soon as yet for a new Secretary to be chosen, or for a new sales address for the Mouse, but chairman Peter Tyler can pass on information about the Mersey Mouse. The pack at present is £37.50 for a mouse and interface complete and ready to plug in, £25 for a complete kit with full wiring instructions, or £6.50 for a set of components, £6.00 for the pcb and the mouse itself for £12.50. An information leaflet is also available. **Contact Peter at 26 Ryder Crescent, Aughton, Nr. Ormskirk, Lancs. L39 5EZ.**

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THE NEW USER GUIDE

SECTION TWENTY SIX

KEYWORD INDEX

This month in the Keyword Index, Mike Lloyd gets on with the RJOB until he gets to SELECT ON.

RJOB taskname, error_code
RJOB tasknum, tasktag, error_code
 [Super Toolkit 2]

taskname	TASK MANAGEMENT COMMAND
tasknum	The name assigned to a task (eg "Quill") (need not be unique)
tasktag	An integer, part of the unique reference for a task
error_code	An integer, part of the unique reference for a task
	A negative integer representing an error condition

RJOB can remove any task other than SuperBasic, and so is of more value to machine code programmers (Turbo users would probably prefer the Turbo Toolkit equivalent of REMOVE_TASK). Usefully, the RJOB syntax allows an error code to be generated which might help a co-operating task to understand what has happened to its late colleague. For the benefit of the machine code fraternity, this value is placed in the D0 register.

RND()
RND(value)
RND(value1 TO value2)

value...	RANDOM NUMBER GENERATOR
	An integer.

Most computer languages allow random numbers to be generated. They are particularly valuable in games and in program testing. SuperBasic's RND function is, appropriately, superior to the average for Basic language in that it can return integers within a specified range. With no parameters, RND() returns a fraction between 0 and 1. If a single positive integer is passed to it then an integer is returned between 0 and the parameter. Two parameters represent a range within which the integer result will fall. This saves the clumsy $X = 5 + \text{RND}() * 5$ format when random numbers between 5 and 10 are required.

QL random numbers are not at all random, but a predictable and repeatable non-repeating sequence that gives the appearance of being random. Use the RANDOMIZE command to initialise the sequence at a given point to get that feeling of déjà vu.

Incidentally, while RND(1, 6) simulates the throw of a single die RND(1, 12) is completely wrong for representing two dice: RND(1, 6) + RND(1, 6) is correct.

RUN line_number

line_number	SUPERBASIC PROGRAM COMMAND
	(Optional) A positive integer less than 32,766

RUN is a simple command that starts the interpreter on its way through the program loaded into memory. MRUN and LRUN are also provided in SuperBasic to find and run program lines from a storage device. (Super Toolkit 2 contains the even more useful but often overlooked DO command.) RUN can be followed by an integer indicating the first line number that should be interpreted; if it does not exist, the program starts running from the next higher line. RUN can be used within programs, although its value is limited and it should not replace GOTO, GOSUB or user-defined procedures.

SAVE filename
SAVEfilename, TO llnenum
SAVEfilename, llnenum TO
SAVEfilename, llnenum1 TO llnenum2
[SuperBasic]

SAVE_O filename, range
[Super Toolkit 2]

SUPERBASIC PROGRAM COMMAND

filename	A valid file name such as "flp1_statsprog", or "bankbal" with Super Toolkit 2, or (less usefully) a valid device such as the network or serial port.
llnenum..	Positive integers representing line number ranges.
range	The same options as for the SAVE command.

The SAVE command commits a program in the QL's memory to be saved to a storage device. This has the obvious benefit of saving you the effort of typing the whole thing in whenever you want to run it. If it is of value, parts of programs can be saved to separate files provided that appropriate ranges are given. The default is to save the whole program to one file. Programs are stored in memory in an encoded format, but written to files in readable text so that they can be read or printed.

Many programmers stick a short user-defined procedure like the one following at the end of their programs to ease the chore of saving regularly. Just type "S" and return to save the program. The suffix "wip" stands for "work in progress" and distinguishes this version, which might have huge holes in its logic, from the most recent runnable version.

```
25000 DEFine PROCedure S
25005 DELETE flp1_bankbal_wip
25010 SAVE flp1_bankbal_wip
```

Super Toolkit 2 owners can eliminate the second line of this procedure by substituting the SAVE_O command, which automatically overwrites any existing file of the same name. It takes exactly the same parameters as its SuperBasic cousin.

SBYTES filename, base, length
[SuperBasic]

SBYTES_O filename, base, length
[Super Toolkit 2]

MEMORY HANDLING COMMAND

location	A valid file name such as "flp1_stats", or a valid device such as the network or serial port.
base	An even integer representing a memory address
length	An even integer

The QL is capable of sending large chunks of its memory into storage onto a microdrive or diskette. This most commonly occurs when users want to save a snapshot of the screen display, but SBYTES can be employed to save any memory area, such as a data set created in a RESPR'd memory segment.

All three parameters following the SBYTES keyword are compulsory. The first is the destination, most usually a file. The second indicates the memory byte at which saving is to begin. The final parameter provides the length of the segment being saved. Both should be even integers. To save a screen, use SBYTES filename, 131072, 32768.

The Super Toolkit 2 extension to the basic command will automatically overwrite any existing file of the same name rather than stop with a complaint.

SCALE #chan, units, xpos, ypos
[Modified by Minerva]

GRAPHICS COMMAND

#chan	(Optional) A valid screen channel number
units	The number of graphics units represented by the height of the window
xpos	The location of the X axis in graphics units
ypos	The location of the Y axis in graphics units

The SCALE command effectively divorces the QL's graphics and its pixels. Pixels, or picture elements, or more recently and unattractively, "pels", are the smallest display units on the screen. It is convenient for the computer to express all graphics in terms of pixels, but for programmers it can be more convenient to deal in other, more arbitrary units. By default, graphics units on the QL are one hundredth of the height of the window in which they are being drawn. SCALE can change this to anything bigger or smaller that the user desires. The remaining two parameters define where on the graphics plane the bottom left of the screen lies. The default is 0,0, but if you are plotting a circle around the origin you might want to shift the origin nearer the centre of the window with a command such as SCALE 50, -25, -25.

Minerva owners have the additional feature of declaring a negative number for the scale units, effectively relocating the window origin to the top left of the window. This brings the graphics location system into line with the pixel-based and character-based systems and, as Stuart McKnight puts it in the Minerva manual, allows you to draw pictures upside-down.

SCROLL #chan, pixels, segment

#chan	SCREEN HANDLING COMMAND (Optional) A valid screen channel
pixels	The number of pixels by which to scroll (an integer)
segmen	t(Optional) A part of the screen according to the following code:

0 The whole window (which is also the default)
1 The top of the window down to, but not including, the cursor line
2 The bottom of the window from immediately below the cursor line

The SCROLL command moves segments of the designated window up or down. A positive integer moves the segment downwards and a negative integer moves the segment upwards. The "blank space" left by scrolling is filled with the current PAPER colour. Unlike the scrolling of program lines or directory listings, SCROLL is a brutal affair that delivers the window contents to their new location immediately. For more gentle and attractive scrolling, put the command into a loop like this:

```
100 FOR pixels = 1 TO 50 STEP 2
110 SCROLL 2
120 END FOR pixels
```

SDATE year, month, day, hour, minute, second [SuperBasic]

SDATE seconds [Minerva]

TIME COMMAND All parameters: positive integers

The QL contains a quartz-modulated clock capable of quite accurate time-keeping. It is a shame, then, that for the lack of a permanent battery supply the clock needs to be reset every time the QL is turned on. Some third party devices do exist, however, that retain the clock setting while the QL is off.

When the QL is turned on, its clock begins from midnight on 1 Jan 1961, presumably its understanding of the year dot. If a single parameter follows an SDATE command then a Minerva-equipped QL will assume it to be the number of seconds since the start of 1961. With a more complete set of parameters any QL will set itself to any date between 1961 and February 2097 (perhaps indicating when Clive Sinclair was planning to issue the QL 2).

The validity checker for date input is not particularly rigorous. References to dates such as the 34th of August are taken to mean 3 September, but the results are unpredictable when a month value greater than 12 or less than 1 is entered.

SEARCH_MEMORY (address, length, string\$) [Turbo Toolkit]

	MEMORY HANDLING FUNCTION
address	An even integer representing a valid memory address
length	An even integer representing a number of memory bytes
string\$	A valid string

This valuable function whips through large chunks of memory very quickly indeed to track down occurrences of whatever you have placed in its third parameter. If no match is found then a 0 is returned, otherwise the function returns the address of the first byte where the match has been found.

To quickly give a flavour of how to make use of the function, imagine setting aside an area of memory to act as a database, using a sequence such as:

```
500 Base = RESPR(26000)
510 LBYTES flp1_data, Base
```

The user could be asked for input to identify what record to retrieve and SEARCH_MEMORY will have the result almost immediately.

```
520 INPUT "Locate what? " ! string$
530 location = SEARCH_MEMORY(Base, 26000, string$)
540 IF location > 0
550 PRINT "Data item located"
560 ELSE
570 PRINT "Date item was not found"
580 ENDIF
```

If the data was in an array, the search would take much, much longer, although the programming would be simpler.

	CONDITIONAL BRANCHING STRUCTURE
variable	A numeric value
variable	[Minerva only] A numeric value or a string

SElect ON variable = 1 TO 10, 20, 50 TO 90:

[Commands]

SElect ON variable

ON variable = x

[Commands]

ON variable = 50 TO 100, 500

[Commands]

ON variable = REMAINDER

[Commands]

END SElect

SElect ON variable = x

[Commands]

= 50 TO 100, 500

[Commands]

= REMAINDER

[Commands]

END SElect

The SElect structure marks a significant improvement in conditional branching over that offered by the IF..THEN..ELSE structure of traditional Basics. Borrowed shamelessly from Pascal, a typical SElect structure comprises a number of tests for a variable, each followed by a set of actions that will be carried out should the variable meet the conditions. The QL's standard range syntax is available, so ON x = can be followed by a single value, a range of values or any combination of the two.

The ON variable = range syntax is rather long-winded and is best left to the purists. For each test, simply start the condition with the equals sign. Should the conditions be prefaced with the optional ON variable then you must make sure that the same variable name is used each time.

The short version of the SElect structure provides a quick way of finding out if a variable's value lies within one or more ranges. If there is only one value to test for, or an open-ended range is involved, use IF in preference to SElect. In other words, IF x > 1000 is preferable to SElect ON x = 1000 TO 9999999.

The interpreter will work its way down the list of tests until it finds one that is true. It will then ignore those that follow and carry on with interpreting the line after the END SElect. It makes sense, therefore, to put the conditions most likely to be true near the top of the structure. You can opt to put a REMAINDER statement at the end of the structure to catch those occasions when none of the tests produces a positive result.

It is worth being aware that seemingly foolproof SElect structures can produce slightly unexpected results, simply because they lull programmers into a false logic. Look at the following:

```
100 SElect ON x
110 = 0 TO 9
120 PRINT "This positive value is less than 10"
130 = 10 TO 99
140 PRINT "This positive value is between 10 and 100"
150 = REMAINDER
140 PRINT "This value is greater than 100 or less than 0"
150 END SElect
```

The whole thing works fine apart from the fact that if X is worth 9.5 you are told it is actually greater than 100. The answer is to take more care over the range values. You might, for instance, rearrange the test conditions to look for the higher values first and then search for values from 0 TO 10. 9.999 will correctly come into this category, but a full 10 will have been picked up in the earlier test condition for 10 TO 99.

With the Minerva rom fitted, SElect becomes even more useful by being able to test strings as well as numbers. It is wonderful to be able to construct tests such as:

```
500 INPUT "Enter your name here: " ! name$
510 SElect ON name$
520 = "David"
530 PRINT "Welcome David, you have full access rights"
535 access = 5
540 = "Sarah" TO "Sarah"
550 PRINT "Welcome Sarah, you have read-only rights"
555 access = 1
560 = REMAINDER
570 PRINT "You do not have access to the program."
580 END SElect
```

Where single strings are involved, checking is case-independent, as demonstrated by the test for "David" above. The test for "Sarah", however, involves a range check and will reject any capitalisation other than that shown.

QUICK-LASER 1.03

Bryan Davies makes the most of his laser printer.

INFORMATION

Program: QuickLaser 1.03

Price: £19.95

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London E4 9SE. Tel. 081 527
5493.

The quality of desktop publishing documents was, for many years, severely restricted by the coarseness of dot-matrix printing. You could not expect much from a print head with nine needles, even when the effective number was increased by various enhancement techniques. The situation was much improved by the advent of 24-pin printers at a reasonable price, but it was still obvious that print was from a "dotty" machine.

All that changed radically when laser printers arrived, and rapidly came down in price to a

level that a fair number of average users could contemplate. Ink-jet printers then offered print quality comparable to that of lasers, for less money.

Driver shortage

What did not occur on the QL scene, for quite a while, was the development of printer drivers that could send DTP output to laser and inkjet printers. There was little point claiming the DTP program itself had capabilities similar to those of much more expensive products when the printed results looked markedly inferior. A link was obviously missing - until QuickLaser came onto the market.

Clearly, QuickLaser ("QLQL" from here on) was produced for use only with its stablemate,

Professional Publisher. As for laser printers, it should work with any of them that claim compatibility with the widely popular Hewlett Packard LaserJet Series II. Inkjet or other types of printer should be suitable, also, provided the magic "HP LaserJet Series II compatible" item is in their specifications. But be careful with that description, because HP has a rather confusing range of model designations, with various models with "II" in their designations. What the compatibility claim refers to is the "Series II", one of the earlier LaserJets. Most laser printers made by manufacturers other than HP have an emulation mode which fits the bill, but check the specification for the right words - anything without HPLJII compatibility can be close to useless because it will

not be usable with much software. Digital Precision point out that (obviously) they cannot accept responsibility for failure of a particular printer to behave like a LaserJet.

QLQL prints in graphics mode, and uses the full 300 x 300 dots per inch resolution of the LaserJet. The results are good. How good, and how fast, depend upon the ram available in your QL system, and the page dimensions of the Professional Publisher page being printed. Some distortion will occur with certain combinations of page size and print mode.

The program comes on one 3.5-inch DD disk. It requires a minimum of 384 kB system memory to run. Performance is stated to be appreciably better with the 896 KB or more of the full Trump Card or the Gold Card. Both serial and parallel printer ports are usable. The output of the basic QL is always serial, of course. Parallel output is available from a few, older interfaces, but the usual method of driving a parallel printer is through a Miracle serial-to-parallel converter. The input devices supported are the usual flp, mdv, fdk, ram, win, and network device names (from SuperToolkit II).

DIGITAL PRECISION BRINGS YOU ROCK SOLID SOFTWARE!


Professional Publisher is simply the best. No other desktop publishing program for the QL even comes close!

A new standard of printing!

Professional Publisher has always been regarded by those who know it as a superb program, giving the best results possible from dot-matrix printers. Now there is "QL QuickLaser", the printer driver that allows Professional Publisher to output at the full 300 dots-per-inch of LaserJet printers! QL QuickLaser (QLQL for short) will drive any Hewlett-Packard LaserJet II printer, or any true compatible. If you have only a 640k RAM QL, then you may still use QLQL to drive one of these fine printers, but at an acceptable 150 dots-per-inch, or at 150 by 100 dots-per-inch.

disk, and QLQL was used to dump the resulting file to the printer, a Hewlett-Packard LaserJet II. If you have enough RAM, you can have both Professional Publisher and QLQL in memory together, speeding things up tremendously.

though, only needs to have the Trump Card 768k to utilise the full 300 dots-per-inch that you see on this page! Look at the examples of text, fill patterns and greyscales in the sample box. All of the fonts on this page are either shipped with Professional

"Roman" text. AaBbCcDdEeFfGgHhIiJjKkLl
"Syreeta" text. AaBbCcDdEeFfGgHhIiJjKkLl
"Louise" text. AaBbCcDdEeFfGgHhIiJjKkLl
Greyscales as possible! Pattern
fills are available, too. 
Italics can be made from any font!

SuperB extensions

SuperBasic extensions files - three of them - are supplied, and are loaded automatically by the boot routine. You can "multi-task" QLQL, and the obvious program to run alongside it is Professional Publisher. A better phrase is "task switch", because you are told in the instructions that ProPub should not be used while QLQL is printing. During sessions when other programs are active at the same time, the

QLQL screen may become corrupted; this is easily fixed by pressing F4.

To show off QLQL's paces, a sample ProPub page is provided, which is 1920 x 1600 pixels in size. This size requires 896 KB or more of ram, if it is to be loaded into ProPub. Another file supplied is named FILL_PATTERNS, to replace the existing file of that name that comes with ProPub. The new version gives better grey-scale and pattern-fill printing with laser printers. If those terms do not mean anything to you, there is still a lot for you to learn about DTP!

Images are not in pure black and white, unless they are so-called line drawings, or text. An obvious line drawing is a pencil-drawn square; the box lines are black, the rest of the area is white. You may have seen the drawing of the Space Shuttle Columbus, which is a common sample file with many drawing and DTP packages; that too is a line drawing. To give depth to an image, levels of blackness have to be present, and the individual levels are part of the "grey

Fill patterns

Fill patterns are used to add "body" to objects which would otherwise look white with black lines around them. For example, there are fancy text founts with ProPub that use "hollow" strokes for characters. The inner parts of the strokes can be decorated with fill patterns, to make the text look more interesting. This effect is demonstrated clearly by the sample page supplied with the program - see Figure one.

The instructions provided with QLQL cover 10 pages. The first few pages contain helpful notes on the practicalities of printing images through laser printers. Users who have spent years struggling to get decent printing from dot-matrix printers may well be "clueless" when it comes to using laser printers, so the advice is welcome.

There may be an UPDATES.DOC Quill file, containing additions to the instructions; none was present with the review copy. You are advised that DP's Perfection word pro-

plied with Perfection SE should be used to maintain formatting (text attributes etc.)

Laser limits

Users unfamiliar with laser printers may be surprised to find them sometimes unable to print graphic images. The basic LaserJet has 512 KB of memory, which might be thought adequate for anything, in view of the fact that dmp printers usually have not more than a few KB of memory. The laser method of printing is significantly different from the dmp method, however. One difference that should be obvious from the first print you make with a laser is that the complete page is printed at one go, rather than done strip-by-strip, dmp fashion. When you think about it, that is likely to mean the laser has to store the data for the whole of the page, before it can start printing it. This is where the amount of printer memory becomes important.

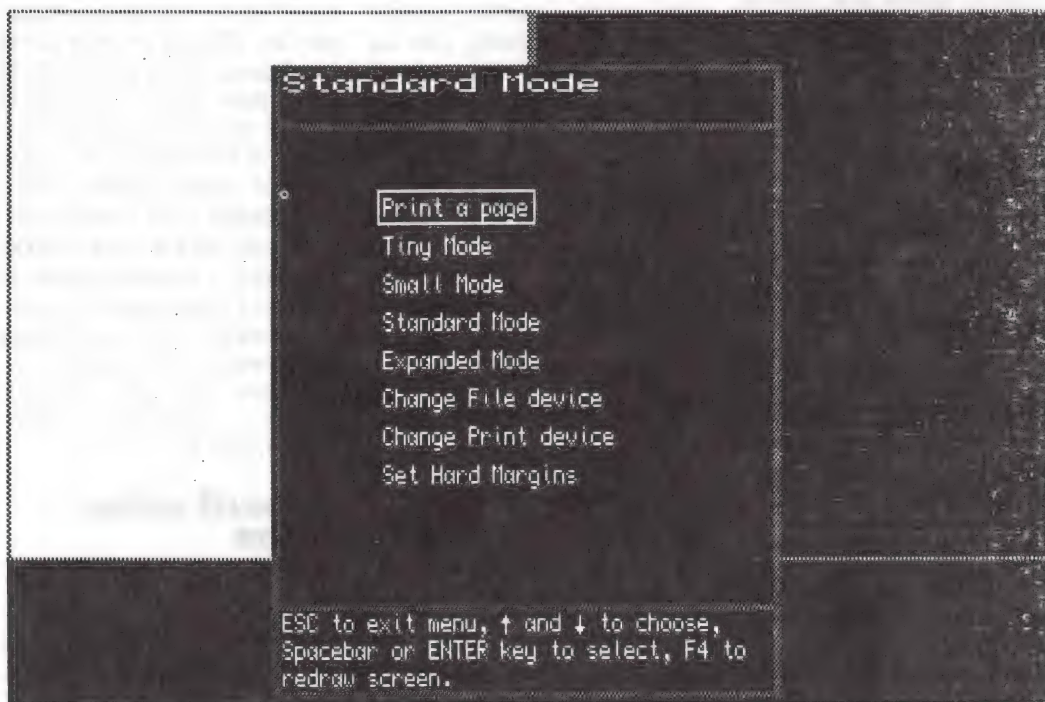
The instructions state that a LaserJet with the standard 512

graphics to a HPLJII with 512 KB, but they are the exception rather than the rule. Should you be stuck with the basic 512 KB - and most people with HPLJIs that I have met are - you can print with QLQL, but the process involves putting the paper back in after the first run, and it takes much longer than does printing with 1 MB or more. Another drawback is that some mis-registration will be apparent, where the two parts of the image meet.

Graphics and text

Impatience is something that has to be suppressed, when printing graphics. The process is much slower than text printing. In the instructions, comparative times are quoted, for the various printing modes of QLQL. The figures are 15, 16, 14 and 210 seconds, for the Tiny, Small, Standard and Expanded modes, respectively. The operation they refer to is the "printing" of a 960 x 800 pixels test page from one file on ramdisk to another one. That is, this is the least time that could be taken, on a standard Gold Card system. Adding the printer into the chain makes the time to print the same page about 15 minutes with the first three modes, and about twice that long with Expanded mode.

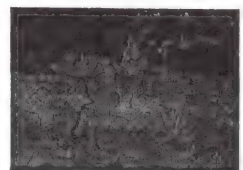
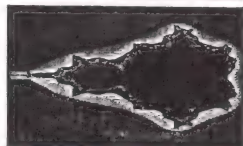
My experience, printing to the Epson GQ-5000 set to HPLJII emulation mode, was both better and worse than the quoted figures for the LaserJet, but not sufficiently so to get excited about. The sample page took under 13 minutes, from floppy disk to printer, using the Small mode; using Expanded mode, the same page took an hour. The Expanded print was halted by a "buffer full" error message from the printer, about half-way through the time, and the paper had to be re-inserted to get the last bit of the image printed. The Epson does have 2 MB of ram, but it is not clear what influence this has on speed, or on the size of image that can be coped with. A useful feature that could be added to QLQL is some form of progress indicator, to let the waiting user know whether he



scale". Colour images cannot be reproduced by most printers, and the different colours need to be represented by suitable grey scales, in order for the printed image to look reasonable.

cessing program is the best way to prepare text for use in ProPub, but that does not stop you using other WP programs for this job. ProPub itself can do any required micro-justification of text prepared with Perfection. The PUBCONVERT utility sup-

KB of ram will not print a full A4 page of graphics. In practice, this is what appears to be true. You will need 1 MB of ram for graphics printing from many programs, including QLQL. To be strictly correct, there are programs that can print full-page



All pictures (other than the Mandelbrot screen) drawn with EYE-Q by M. Knight.

or she has time to go away and do something else.

Multiple gain

One feature of laser printing that should be borne in mind is the difference in time taken for several copies, compared to one print. The bulk of the time is taken in the production of the first print; subsequent prints should be done very much faster. This applies only if the number of copies is set at the printer. QLQL itself does not have a multiple-copy setting.

The initial menu is shown in Figure two. The highlight box is on the "Print a page" option, and you can simply press Enter with it there, select a file from the list that is presented, press Enter again, then go away and make coffee while the program and printer think it over. The default printing mode is Standard. From the sample 1920 x 1600 pixels page, that produces an image filling an A4 page (in portrait orientation) but showing only half of the original page image. Selecting the Tiny mode before printing results in the whole image being printed, covering half of the portrait page. Small mode printed the whole image, taking about three-quarters of the page for it. That leaves just Expanded mode, and that pro-

duced a full-page print, of one quarter of the original image. The quality is excellent in all modes.

It is the Small mode which was used to produce Figure one. QL World now has a superior method of transferring images to the magazine pages, and the detail in the fancy text should be reproduced quite well. Look at the fill patterns in the text box, and at "ROCK SOLID" in the heading. Those with vivid imaginations can now let them run riot. It is not even necessary to design your own founts, as some good ones come with ProPub. For contrast, Figure three contains several drawings, done by the writer of QuickLaser. He used DP's Eye-Q graphics program to produce this page. The print was done in Standard mode, and the quality speaks for itself.

Disk tactics

Once QLQL has been started, you can remove the program disk and insert a disk containing images. Alternatively, you can load ProPub from another disk. This is where the advantage of having ED drives really becomes apparent. QLQL opens the file to be printed, and keeps it open throughout the process. To save time, and take

less chances with image files, it is preferable to copy the latter to ramdisk. One of the perennial problems with printing is not being able to stop it when something is seen to be going wrong; the QLQL instructions offer a primitive, but effective, way of dealing with this - pull the disk out! The error condition is then noticed much faster by the program than it will be after the Esc key is pressed.

The image page sizes advised for a 640 KB system are 960 x 800 or 960 x 960 pixels, for Expanded and Standard mode respectively. The print resolution is 150 x 150 dots per inch - a quarter of the maximum capability of the LaserJet. To get more, you need more memory in the QL system. When the ram size is 896 KB or greater, use the page size 1920 x 1600 pixels and print from the Small mode. This makes use of the full 300 x 300 dpi available from the printer, giving the best results. The Tiny mode is recommended for printing letterheads.

Dottiness of text was not evident in the Tiny and Small print modes, but began to show with Standard, and was fairly evident at Expanded. Bear in mind, though, that this assessment is based on years of experience with laser printing by dmp standards, none of the printed samples would be considered dotty. One warning is given towards the end of the instructions, concerning printing saved partial pages; the width of such pages must be a multiple of 8 pixels. The height can be anything from 1 to 1600 pixels.

Conclusion

The facility to use a laser printer is essential for good quality DTP output. This program is very easy to use; definitely not in the head-scratching category. When you have spent the money for a laser printer, the additional cost of QuickLaser is small, and the improvement in output over dot matrix print is large. Add a little for extra coffee, though, while you wait for the lovely pictures to emerge.

QUICKLASER 1.03

QL Bulletin Boards

Hilary Snaden recommends BBSs as a source of software and QL contact.

Most QL owners looking for free software will probably look first to public domain libraries, but those with modems and terminal software have a further option. Bulletin boards are well-known as an electronic messaging facility, but there is also a good deal of free software to be found on them. Much of this is not available elsewhere, having been put there by programmers for trial and comment or in response to another board user.

This article attempts to give a few hints to those who have not explored this part of the computer scene, and to highlight some of the best software on QL bulletin boards.

XMODEM

To be sure of being able to download software from a QL bulletin board you will need (of course) a modem, and terminal software with the *Xmodem* file transfer protocol built into it.

It is possible to download basic programs and text files without Xmodem, by using the View option on the bulletin board menu to display them on-screen while simultaneously logging them to disc, and then correcting (if possible) in a text editor any errors which may have crept in due to line noise. However, this will almost certainly fail with machine code, as errors will be more difficult to detect, and because raw machine code will frequently contain control codes which will be intercepted by the receiving

software.

Xmodem works by sending a few bytes at a time and then making sure that a checksum in the data corroborates that they have been received accurately. This makes it slightly slower than downloading data unchecked, but it is more than worth the extra time. If, however, you have a noisy line then even this may fail, as Xmodem will only resend a block of data so many times before aborting.

Charges

The only cost to be incurred in downloading software from bulletin boards is that of the call charges, so the faster your modem, the less you will have to pay the telephone company. But make sure that your terminal software is set for a speed compatible with the bulletin board you are trying to log on to.

To find out exactly how the file transfer options work on your terminal software, read the manual. Some aspects of file transfer, particularly causes of failure, are not obvious but useful to know, and these may well be explained. As a rough guide to timing with Xmodem, a 50K file will take around ten minutes to transfer at 1200 baud, proportionately more or less at lower or higher speeds.

Many of the files on bulletin boards are compacted or archived to save space on the host system, and time and money for the caller. In all cases the appropriate decompacting or unarchiving software is avail-

able from the same boards, so plan to download these first.

The most archiving common methods used on QL-based boards are CPT (used for single files), ARC and ZIP. ARC and ZIP are the same as on MS-DOS and other machines, and can handle multiple files, so that a group of related programs, documentation, etc., is compacted into a single file with the suffix `_ARC` or `_ZIP`. These need the programs called UNOPT, ARC and UNZIP to get at the encoded files.

You may also encounter the suffix `_LZH`. This signifies a more recent archiving method requiring a program called QLHARC to access the data.

Unarchiving

The unarchiving program will extract all the component files at the same time as decompacting them, as well as ensuring that EXECable files are written to disk with the essential file header information which tells Qdos how much dataspace to allocate to the program.

If you intend to frequent bulletin boards it may be useful to keep all these file "hacking" programs on a single disk, along with the terminal software. Remember also that both ARC and ZIP have a number of options available, such as listing the contents of an archived file without extracting it, and it is not always obvious how to use them, so read the documentation, and the advice on downloading given on the boards

themselves.

You will need to leave your name (your real name), and telephone number when you first log on, so that the sysops (system operators) know who you are. It is unlikely that you will be able simply to pick a convenient bulletin board, log on and immediately start downloading software, as most sysops will wait a while for users to have logged on a few times before giving them access to the files.

Contribute!

This is by way of a subtle hint that bulletin boards are a two-way communication system, and users are encouraged to contribute to it. You may not be much of a programmer, but you will almost certainly have some knowledge which could be of use to fellow board users, so rather than heading straight for the files area, have a look around the message area and see if you can help with the problems or contribute to the debates which are the hallmark of a lively board.

It is often the message area rather than the files which justify the existence of a bulletin board, and if no-one bothers to keep it alive it will close down and no-one will have the benefit.

You will also be able to upload software and other files to the bulletin boards, and are positively encouraged to do so. In this, users limited to V23 (1200/75 baud) modems such as the Qconnect will find themselves at a serious disadvantage, since

while receiving takes place at 1200 baud, sending at 75 baud is very slow. In this case it may well be cheaper to send the files on a disk by post to the sysop with a request to place them on the system. Note that any software uploaded onto bulletin boards must be either original or placed with the permission of the copyright holder (usually the author, but sometimes, as with some ex-commercial software, a publisher).

Closing down

As with proper computing practice everywhere, it is important when logging off to use the proper command on the menu of the system you are connected to, rather than simply dropping the line, a guaranteed method of incurring the enmity of the most mild-mannered sysop should you make a habit of it. Using the proper command keeps the host system in touch with what's going on, and ensures that the file and message pointers which it maintains for your benefit are updated. Dropping the line should only be used as a last resort, for example if the host system has locked up, as can occasionally happen.

My list of interesting software is by no means exhaustive, merely giving an idea of what can be found, and there are a great many other programs, from games to graphics demonstrations, which users may find useful or interesting.

Different bulletin boards may have different versions of the same program, depending on how much time the sysop can spare for keeping the file section up-to-date. Where these are known, the latest version is described as this will almost certainly be an improvement on its forebears.

It is difficult in a short space to do justice to Jonathan Hudson's *QeM*, which has by August reached version 3.6. While *QeM* cannot handle Viewdata format boards such as Prestel, it has in addition to the XMODEM file-transfer protocol mentioned earlier, YMODEM, ZMODEM, and KERMIT protocols, and VT52, VT100 and a number of alterna-

tive ANSI emulations.

The terminal emulators will run in an unexpanded QL, but extra memory is required to make use of the external file transfer protocols. Since the program has neither a permanently active cursor, nor a screen restore routine, multi-tasking is best done with the help of the Pointer Interface and Window Manager.

Considerable configuration of the program is possible, and although the suggested method for use with the Tandata QConnect-QMod-QCon modem does not appear to work, Hayes-compatible modems can now be found cheaply, and *QeM* seems more than happy with them with or without the assistance of the QConnect RS232 port.

It is not an easy program to set up, particularly for newcomers to comms, but it is worth the trouble. If you have a QL and a Hayes modem, *QeM* is the program to start a deep and meaningful relationship between them.

Qdos to MS-DOS

IBMDisk is another utility by Jonathan Hudson which, like the better-known *DiscOver*, provides directory information on and transfers files between Qdos, MS-DOS and Atari ST disks. It is well-documented and delightfully easy to use. Look for version 1.9. This program requires a minimum of 256K ram, two disk drives and Toolkit II.

RESQL, by Hans Lub, may provide an escape for those awful moments (we have all done it) when we realise, in the moment that our finger presses Enter, that we didn't really want to delete that file at all. If the disk has not been written to since the unwanted DELETE, *RESQL* can map the sectors which the delete operation has marked as "free", and "undelete" the file by piecing together the fragments and writing the reconstructed file to another disk. The version number of 0.00 suggests that this is a prototype, and the "New disk" command seems occasionally to lock up the program (though if this happens one can

still remove the program, using Toolkit II's RJOB command, and start again) but it is nonetheless very useful. Minimum requirements are 256K ram, a disk drive and Toolkit II.

QED is a superb piece of programming by Jan Bredenbeek, author of versions of the UNARC and UNZIP utilities found on bulletin boards, as well as QBOX and HARDBAK. It is a fast text editor with comprehensive documentation, on-line help and a configuration program. *QED* works something like Digital Precision's well-known The Editor, though without the ability to handle binary files, but is less than 8K in length, so multiple copies can be run even in unexpanded machines. It multi-tasks immaculately using EXEC, though it is also an excellent candidate for installation under a basic keyword, and is highly recommended.

Your own BBS

QBOX is the host bulletin board software used by most QL-based systems. If you fancy trying to set up your own board, you can download the program, documentation and other associated files for perusal. *QBOX* is shareware rather than public domain, and if you intend using it seriously you will need to pay a modest fee to the author to be kept up-to-date with the latest developments, and in fairness for his many hours of programming time in developing the program.

HARDBAK is a simple and very compact program intended primarily as a means of backing-up the contents of a hard disk to a string of floppies, but it can also copy files between any two directory devices. Unlike many copying utilities *HARDBAK* preserves the source files' original timestamps, and since it makes use of as much free ram as it can find (less 16K) the copying process can be very fast indeed with this program.

Since the first, somewhat tentative, days of QL-based bulletin boards a number, in both the UK and Europe, have become linked to a worldwide network of computers called Fidonet. Messages are exchanged

between the various nodes on the network at less busy times and when long-distance calls are cheapest (around 3 am); from the QL user's point of view a number of message areas are in effect shared, and messages can be sent to or read from any of the boards on the network from the one nearest and cheapest to call. This facility does not generally apply to files, however, and if the file that you want is only available from one particular board then that is the board you will have to call.

Boards to try

The bulletin boards mentioned here also have message and file areas dedicated specifically to programming in C, and often have the latest versions of components of the increasingly-popular C68 compiler before they are available from public domain libraries. They are also the most convenient way to find information on how to get the best from the Minerva operating system.

The following UK boards have been found to have particularly good selections of software available, and being very reliable. However, most boards aimed at the QL community have a range of software, and all are worth calling, particularly as the bulletin board scene is always changing, with new software appearing and, occasionally, new boards being started.

Changes of telephone number also occur from time to time and the latest information on all of this can usually be found on other boards - it pays to keep in fairly regular contact.

Both require calling software to be set to scrolling mode, space parity, and one of the following speeds: 300/300, 1200/1200, 2400/2400 or 1200/75.

QBBS

Sysop: Tony Firshman
Telephone: 0344 890987
Hours: All day

4th dimension

Sysop: Wayne Weedon
Telephone: 0202 600305
Hours: 9am - 6pm only

SuperBasic In Action

Simon Goodwin builds a comprehensive file-requester in extended SuperBasic.

A file requester lets you select files on any device by pointing at names in a list. **Requesters** are so useful for file manipulation that they have spawned full-blown utilities like Xtree for PCs and SID or DirWork on the Amiga.

These utilities are little more than multiple file requesters, with a few 'buttons' to perform functions like copying, viewing or printing files, but they're so easy to use that they're often preferable to a QL-style command line, especially when browsing or re-organising data on disks.

DIY Toolkit enthusiasts will remember the _DEF functions for SuperBasic, which let you select procedure and function names from a menu. The SuperBasic file requester is similar, in that it displays a list of names which you can scroll through to make a selection, but it has many more features.

Multiple selections are allowed, so you can pick any batch of files at one stroke. A 'scroll-bar' shows the proportion of the list on the screen - unlike the PC Windows equivalent - and your position in the list, updated as you move through the names.

The **SuperBasic in Action** file requester reads all available device names from system memory and lets you pick any drive by name, like a file. It also supports sub-directories on systems that organise files that way. The default suits QJump's level 2 drivers, as used on the Gold Card and upgraded ST emulators, Trump Cards and SuperQBoards; it should also suit CST Thor sub-directories if you change the file type it is looking for from 255 to 3.

The program works fine if you

do not use sub-directories, and handles up to 480 files per disk - the theoretical upper limit for a 720K drive. You can increase this if you've got a Gold Card, and memory to burn; the default uses about 20K for a full directory. The limits are encoded as strings in the program so you can still patch them easily after compilation.

The requester works in **Mode4**, **Mode8** or **Mode12**, showing full Qdos file names with no restriction on length. You can configure the character and window-sizes, colours and border, and fit two full-sized 25 line requesters side-by-side on a Mode4 monitor screen.

Mice and sticks

Selections can be made with the cursor keys, or a joystick in port CTRL1, or a mouse with keyboard emulation, like SERmouse or the Amiga Qdos mouse driver. Most two or three-button mice are suitable; if it works at all with Quill, it should work well

```

100 REMark SuperBASIC in Action QDOS FILE REQUESTER
110 REMark By Simon N Goodwin for Sinclair QL World
120 REMark Version 1.4, tested 3rd-17th August 1993
130 REMark Extensions: INPUT$, EDIT$ or EDLINE$, CHAN_W$, ANYOPEN$,
140 REMark PEEK$, SYSBASE, NEWCHAN$, MINIMUM$, STRING$, SET_PRIORITY
150 REMark Two TURBO compiler optimisation directives follow:
160 IMPLICIT% i,j,k,n,d
170 DATA_AREA 20
180 :
190 path$="flp1_" : mark%=0 : MODE 4 :REMark or 8 or 12
200 PRINT #0;"At '" & REQUEST$(#0) & "' in '" & path$ & "'
210 :
220 DEFINE FUNCTION REQUEST$(status%)
230 REMark STATUS% = report window # (2 by 36 chars or more)
240 REMark Globals: MARK% = select default; PATH$ = drive/directory
250 REMark Bit 8 of FLAG% entries marks selections in DIR$
260 LOCAL menu$,scroll_bar$,here$,Line$,width$,height$,margin%
270 REMark LOCAL size_x$,size_y$,char_x$,char_y$,border$,border_colour%
280 REMark LOCAL max_files$,name_limit$,dir_type$,type_mask$,pick_mask%
290 :
300 max_files$="480 *MaxFiles" :REMark Generous for 720K disks
310 name_limit$="36 :REMark Standard maximum for Qdos directories
320 text_lines$="2 *TextLines" :REMark Configurable, 1 to 25
330 size_x$="1 *XcSize" :REMark 0 or 2 in MODE 8/12; 0 to 2 in MODE 4
340 size_y$="0 *YcSize" :REMark Configurable to 0 or 1 (double height)
350 CSIZE #status$,size_x$,size_y%
360 char_x$=CHAN_W$(#status$,38)
370 char_y$=CHAN_W$(#status$,40)
380 :
390 dir_type$="255 *DirFileType" : type_mask%=255 : pick_mask%=256
400 DIM dir$(max_files$,name_limit$) :REMark names from 1 onwards
410 DIM flag$(max_files$) :REMark Global for multiple selections
420 :
430 menu$=NEWCHAN$
440 border$="3 *BorderWidth" : border_colour$="50 *BorderColour"
450 width$=char_x$ * name_limit$ + border$ * 4
460 height$=char_y$ * text_lines$ + border$ * 2
470 margin$=(40-border$*2)
480 OPEN #menu$,"SCR_" & width$ & "x" & height$ & "a" & margin$ & "x3"
490 :
500 scroll_bar$=NEWCHAN$
510 OPEN #scroll_bar$,"SCR_8x" & height$ & "a" & (2*width$+margin$) & "x3"
520 PAPER #scroll_bar$,2
530 width$=width$ - border$ * 4
540 :
550 GET_DIR
560 here%=0 : Line%=here%
570 TIDY_MENU
580 SHELL_SORT
590 FILL_WINDOW here%
600 CURSEN #status%
610 CHOOSE
620 CLOSE #scroll_bar$
630 CLOSE #menu$
640 :
650 IF here%=0
660 RETURN ""
670 ELSE
680 RETURN dir$(here%)
690 END IF
700 END DEFINE REQUEST$
710 :
720 DEFINE PROCEDURE GET_DIR
730 LOCAL dir$,length$,name$(name_limit$),head$(64)

```

with the SuperBasic in Action file requester.

You may need to press Shift or Alt as well to select short-cut functions, like paging, drag selection and direct moves to

the start or end of the list. It uses Enter and SPACE to 'do' or select entries, and Esc or the middle button on a three-button mouse to escape, as usual.

The program makes abundant


```

740 dir%=ANYOPEN$(path$,4)
750 IF dir%>0
760 PRINT #status%;"Reading directory"!path$
770 free%=1
780 :
790 REPEAT seek
800 IF EOF(#dir%) THEN EXIT seek
810 head$=INPUT$(#dir%,64)
820 IF head$(1 TO 16)=FILL$(CHR$(0),16) : NEXT seek
830 flag$(free%)=CODE(head$(6)) || mark%
840 length%=STRING$(head$(15 TO 16))
850 name$=head$(17 TO 16+length%)
860 IF flag$(free%)=dir_type% : name$=name$ & " ->"
870 dir$(free%)=name$
880 free%=free%+1
890 IF free%>max_files% THEN EXIT seek
900 END REPEAT seek
910 :
920 CLOSE #dir%
930 END IF
940 flag$(0)=dir_type% || pick_mask%
950 IF " " INSTR path$ = LEN(path$)
960 dir$(0)="-<- DRIVES"
970 ELSE
980 dir$(0)="-<- PARENT"
990 END IF
1000 END DEFINE GET_DIR
1010 :
1020 DEFINE PROCEDURE SHELL_SORT
1030 LOCAL i,j,k,n,d,passes,z%,z$(name_Limit%)
1040 n=free%-1
1050 IF n=2
1060 IF dir$(1)>dir$(2)
1070 z$=dir$(1) : z%=flag%(1)
1080 dir$(1)=dir$(2) : flag%(1)=flag%(2)
1090 dir$(2)=z$ : flag%(2)=z%
1100 END IF
1110 END IF
1120 IF n>2
1130 d=1 : passes=0
1140 REPEAT size
1150 d=3*d
1160 IF d>n : EXIT size
1170 passes=passes+1
1180 END REPEAT size
1190 IF passes>2
1200 PRINT #status%;"Sorting"!n!"names in"!passes!"passes"!
1210 END IF
1220 d=d DIV 2
1230 REPEAT pass
1240 PRINT #0!"!"
1250 d=d DIV 3
1260 FOR i=1 TO d
1270 FOR j=1 TO n-d STEP d
1280 z$=dir$(j+d) : z%=flag%(j+d)
1290 FOR k=j TO 0 STEP -d
1300 IF z$>dir$(k) THEN EXIT k
1310 dir$(k+d)=dir$(k)
1320 flag%(k+d)=flag%(k)
1330 END FOR k
1340 dir$(k+d)=z$
1350 flag%(k+d)=z%
1360 END FOR j
1370 END FOR i

```

use of Toolkit commands, but most of these can be replaced by slower SuperBasic equivalents. The rest are widely available or appear in this month's DIY Toolkit column. I shall discuss alternatives as I explain the listing.

The aim is to illustrate SuperBasic programming with a routine that will be useful in almost any program you write. Taskmaster and QJump's Q-Pointer systems include several requesters, but it is not possible to customise these for your own purposes.

Ergon Development use an elegant collection of requesters

in their programs, but these are supplied in Turbo-compiled tasks so you cannot re-use the code. The SuperBasic in Action file requester can be edited and compiled to work any way you like.

In future issues I plan to build a package like DirWork for Qdos, but the first step is to develop a generic SuperBasic file requester. This month's listing sets up the screen, reads and sorts the directory. Next time I shall complete the requester with routines to move around the list and search the system for directory devices.

All Sorts

The requester includes a neat delayed-exchange **Shell Sort** routine, which sorts two arrays in this example but can be adapted simply for other types of data. The Shell Sort is almost as efficient as the Quicksort, the favorite of many computer scientists; in fact it demands less memory and has fewer special cases, often beating the Quicksort when the data is not in genuinely random order.

The basic Shell Sort is well-known, but this implementation is extra-fast because it makes fewer swaps than the usual implementation. The standard Shell Sort works by stepping through the data in decreasing strides, swapping elements as necessary, until the final pass which examines every element, by which time the items are

almost in order and few swaps are needed.

The delayed exchange variant uses temporary variables Z\$ and Z% to hold candidates for exchange, and moves them straight to the right place with fewer swaps (or exchanges, or swaps if you will). I picked up this idea from a SAM Basic program by mathematician and Sinclair enthusiast W. Ettrick Thomson, and it works every bit as neatly in SuperBasic.

Sorting is a fascinating topic, and the definitive book on the subject is Donald Knuth's ('Newth') **Sorting and Searching** published by Addison Wesley

20 years ago and now available in paperback. It's utterly brilliant but sometimes heavy going unless you're a pure mathematician like the author. Knuth's series **The Art of Computer Programming** is widely held to be the best set of computer science books yet written, and contributed many ideas like heaps and queues to Qdos. Let us know if you'd like to see reviews of the volumes in these pages.

Program notes

Lines 190 and 200 are directives for Turbo, not needed unless you plan to Turbocharge the requester. Two global variables, PATH\$ and MARK%, set the initial state; PATH\$ is the directory to be read, and could be read from the Toolkit 2 default with the DATAD\$ extension. MARK% determines the initial value of the flag for each name in the directory. Set it to 256 and all files will initially be selected, or zero to let the user select from a clean start.

The requester sets up two arrays; DIR\$ holds the name of every file in the directory, from element 1 to FREE%-1. DIR\$(0) holds a dummy heading. The other array FLAG% holds the type of each file and a single-bit flag to indicate that a file is selected. Bitwise logical operators are used to separate the two fields in each integer, saving the need for two arrays.

It would be more elegant to do this with sets and records in a language like Pascal or Modula 2, but SuperBasic has C-style bitwise operators like && and || which make it easy to test, set and extract bits. FLAG% || 256 sets bit 8, without touching the others, while FLAG% && 256 tests just that bit, and FLAG% && 255 extracts the Qdos file type from the low byte. The file type is useful as it discriminates tasks and directories from normal files.

The values 255 and 256 may change if you want to re-assign bits later, so they are given names TYPE_MASK% and PICK_MASK% in the program. This also helps to make it clear what the code is up to.

On return PATH\$ may be


```

1380 IF d=1 THEN EXIT pass
1390 END REPEAT pass
1400 END IF
1410 CLS #status%
1420 END DEFine SHELL_SORT
1430 :
1440 DEFine PROCedure FILL_WINDOW(from%)
1450 LOCAL n
1460 CLS #menu%
1470 FOR n=from% TO MINIMUM%(from%+text_Lines%,free%)-1
1480 ECHO_NAME n
1490 END FOR n
1500 AT #menu%,Line%,0
1510 END DEFine FILL_WINDOW
1520 :
1530 DEFine PROCedure ECHO_NAME(n%)
1540 IF flag%(n%) && pick_mask%
1550 PAPER #menu%,2 : ELSE PAPER #menu%,0
1560 END IF
1570 IF dir_type%=(flag%(n%) && type_mask%)
1580 INK #menu%,7 : ELSE INK #menu%,4
1590 END IF
1600 PRINT #menu%,dir$(n%) : CLS #menu%,4
1610 IF flag%(n%) && pick_mask% : PAPER #menu%,0
1620 END DEFine ECHO_NAME
1630 :
1640 DEFine PROCedure TIDY_MENU
1650 BORDER #menu%,0
1660 CLS #menu%
1670 CSIZE #menu%,size_x%,size_y%
1680 INK #menu%,4 : PAPER #menu%,0 :REMark Beware interaction!
1690 IF border%>1 : BORDER #menu%,border%-1,border_colour%
1700 IF border%>0 : BORDER #menu%,border%,128
1710 SLIDER
1720 END DEFine TIDY_MENU
1730 :
1740 DEFine PROCedure REDRAW
1750 TIDY_MENU
1760 FILL_WINDOW here%-Line%
1770 BLAT Line%
1780 END DEFine REDRAW
1790 :
1800 DEFine PROCedure SLIDER
1810 LOCAL delta
1820 CLS #scroll_bar%
1830 IF text_Lines%>free%-1
1840 depth%=char_y% * text_Lines%
1850 ELSE
1860 depth%=(text_Lines% ^ 2 * char_y%) DIV free%
1870 END IF
1880 IF free%>1
1890 delta=here%-Line% :REMark Ensure decimal division
1900 offset%=(char_y% * text_Lines% * delta )/free%
1910 ELSE
1920 offset%=0
1930 END IF
1940 REMark The slider must be at least two pixels tall
1950 IF depth%<2
1960 depth%=2
1970 IF border%<2 THEN offset%=offset%-2
1980 IF offset%<0 THEN offset%=0
1990 END IF
2000 BLOCK #scroll_bar%,4,depth%,2,offset%+border%,7
2010 END DEFine SLIDER

```

updated. If the result of REQUEST\$ was null, Escape was pressed; otherwise it returns the name of the file picked on the device PATH\$. If multiple files are selected you can find their names by looking for PICK_MASK% bits set in corresponding FLAG% entries.

Lines 270 and 280 comment out LOCAL declarations for pre-set values used in the requester, as most versions of SuperBasic get into a mess if you use more than nine parameters or LOCALs in a single definition. If you use Minerva, an MG rom or any compiler you can re-introduce the lines, making the requester

more modular and easier to merge with other programs.

The DIY Toolkit NEWCHAN% function has a similar purpose, ensuring that the requester does not clobber active channels. You can replace the calls with constant values like 3 and 4 in lines 430 and 500 respectively, as long as you are sure that the calling program does not use these channels.

Window limits

The requester uses three windows: MENU% for the list of names, STATUS% for reports and input, and SCROLL_BAR%

for the sliding indicator alongside the main list.

The character-size and border must leave room for the scroll bar: eight Mode4 pixels, including borders. This rules out only CSIZE 3,0 and 3,1. Double height characters work fine if you make the height of the window a multiple of 20 rather than 10 pixels.

If you're determined to squeeze extra lines onto the screen, use CHAR_INC or _YSTEP to reduce the step between lines, like the Taskmaster FILES menu and Devpac's lower window. The program uses CHAN_W% from DIY Toolkit Volume C to detect the height selected and adjust scrolling automatically.

Alternatively use PEEK_W and CHBASE from DIY Toolkit Volume Q, or a SuperBasic routine like FN Y_SIZE% in the Turbo Toolkit

demos file, which has the weakness that it is upset by Thor and QJump windowing. If all else fails, explicitly state or 'hard-wire' the values that match your chosen character-size but remember to change all the values when you try a new CSIZE!

A second window of two or more lines accepts input and displays status reports. In this example I use the command line window #0, but any other console window of two or more 36+ character lines will do.

Line 600 uses CURSEN from Toolkit 2 to enable the cursor, allowing input from the status window, but you could replace

this with equivalents like CURSOR_ON from Turbo Toolkit, QTRAP #0,14 from DIY Volume T, or an obscure call like PAN #0,0,115.

The new DIY Toolkit extensions ANYOPEN% and INPUT\$ are used to access the directory in PROCedure GET_DIR. STRING% converts the integer length word into an integer value, but you can safely take the CODE of the second byte HEAD\$(16) if you do not have Turbo Toolkit or Mark J Swift's PD Toolkit.

Next Month

The listing is complete until it calls CHOOSE at line 610. By that time it should have displayed the scroll bar and first page of the directory. Next month I shall bring the requester to life, with routines like CHOOSE to make selections and move through the list.

SuperBasic In Action

H

ardy ints

**Perennial
Solutions to
perennial prob-
lems. If you have
any favourites,
please send
them in.**

Reading

Stuart Risby's question in Open Channel, QL World January 1993, I started thinking about an answer.

I am a software engineer (and a former hardware design engineer) who is concerned with the problem of data acquisition. I produce commercial software for VAX/VMS systems, but the problem is still the same. How to get data into the computer? I shall describe a few schemes that I hope you will pass on to Stuart.

One approach is to have all input quantities as pulses, so that a single digital pulse represents a unit of electricity (or a unit of temperature, or a Mars bar!) That's simple. All you have to do then is to count the digital pulses. Incidentally, Maplin Electronics, who publish the Maplin Magazine and a catalogue through newsagents, provide a range of circuit boards

for temperature, humidity, light, etc., that could be adapted.

The following techniques all assume that the inputs are digital:

1) Use a QL rom cartridge. By using a buffer (the 74HC244, for instance) and the P/ROM output enable line, it is possible to read an eight-bit quantity into the QL. This byte could be an eight-bit value (such as eight bits from an Analogue to Digital converter) or an eight-bit count (from a counter chip). This only provides a single input in the range 0-255, unless you start using the PROM address lines to select other counter/buffer chips.

This is the simplest way, but it is very QL-specific (it cannot be used on other systems). Typical circuits are shown in the diagrams. The address of the first buffer is starting address of the rom cartridge, and can be read

from SuperBasic by a simple PEEK instruction. IC pinouts are according to the Maplin catalogue.

2) In most of the commercial systems I have dealt with, data is read in via the serial

communications ports of the computer. In these systems, data is collected directly, or via modem, line driver or PAD. So how to read data into the QL using serial ports? This problem has two solutions:

A) Use a simple UART chip such as the 6402. It converts serial data to parallel, and vice versa. So data can be presented on its parallel inputs to be transmitted serially to the QL. Here again we only have eight bits of data, but now we have a choice of: does the UART send out data (count value) continuously, or do we request it? (By writing a character first, for example.) As in the rom cartridge solution above, we can use a character sent FROM the QL (which gets converted into eight receive bits) to select a specific counter.

B) The final solution is to use a data acquisition device which collects and records the number of pulses on multiple input channels. The main computer then periodically interrogates the device for data collected over three minutes, half-hour periods, or days.

In the industrial world, these devices are quite expensive, but one of my

pet projects (as yet unfinished) is to build a cheap alternative based on an Intel 8051 microcontroller (enhanced 8048). The 8051 has internal memory, timers, serial communications, and digital ports on-chip. A circuit board of only five or so ICs is enough for the basis of a basic data collector; storing half-hour data for eight channels for ten days. A simple protocol will allow my QL to extract the data using SER1 or SER2 directly in Abacus export format.

All the development so far has been done on my QL using Quill for documents, Conqueror, TASM assembler for MS-DOS, and C69/RATC compilers for software investigations.

Philip Johnson, Stoke on Trent, Staffs

Figure two
Basic circuit - decoded

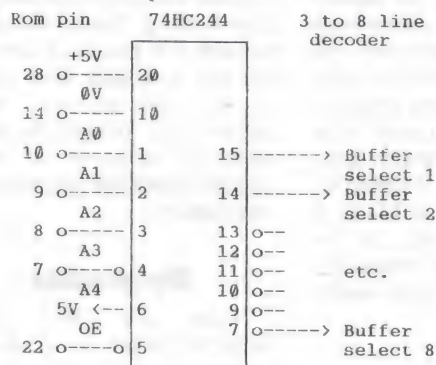


Figure one
Basic circuit - single buffer



If additional buffers are required, disconnect the link from pins 1,19 above and attach them to the appropriate Buffer Select, as indicated in Figure two.

REMINDE- Me-Plus 2

Henry Orlowski gets an intelligent reminder from his QL.

If you're anything like me you're always getting into trouble because you forget your wedding anniversary or the kids' birthdays or you've missed your dentist's appointment.

The reason you keep missing these important events is because you spend all your spare time on your QL. What you need is some sort of intelligent diary. And if that diary is combined with your QL, and you can call your appointments up on screen any time.

Remind_me_plus2 (Rmp2) is just such an intelligent diary. I call it intelligent because it quickly, even automatically, goes to the right date and gives you your appointments or reminders for the day in question, as well as telling you what you may have missed recently (to see if you can retrieve the situation) and lists other events falling due within the month. Just think! No more missed appointments, an ordered lifestyle and appreciative friends and relatives.

Better diary

But what's the advantage over an ordinary diary? Several. You've probably got a diary which you don't use. This one works on the QL which you use all the time, as part of the suite of applications you run constantly. Regular monthly or annual events such as payment dates or birthdays are entered once only, unlike a diary which you have to change and write up every year. You get a wider perspective of dates in a clear

at-a-glance format. Finally it is very quick to run. No searching for the book and the right page.

The program comes complete with an existing schedule of events which will be of little use to you unless you are or are closely related to author Joe Haftke! However it provides a basic structure and allows you to edit events and dates easily to ones appropriate to you. It also serves as a basic schedule for you to run the program and carry out some demonstrations for familiarisation.

Once you've got the hang of it you're ready to go editing. There is room to store up to 108 individual entries. For the editing process you are presented with 54 at a time on screen. I find it useful at this stage to do a hardcopy, so that you can work out on paper what you wish to put in at the initial set up stage. Once you've got your basic schedule you can just edit the few you need on screen very quickly without having to do a printout every time. The editing option allows you to amend existing entries and add new events. Past events do not need to be taken out unless you run out of spare slots in your schedule.

Autosorting

The schedule allows you to enter the name or description of the event up to 40 characters. The event can be one-off or repeated automatically on a monthly or annual basis. If there are odd events for which you have no

dates you can enter them with an unreal date and the program will report on it every time. This is a useful reminder or messaging system. It doesn't matter which order you enter the events, as the program sorts out the chronology at report runtime.

When you run the program you are first presented with "today's date" to confirm or amend. The only exception is if you are using the Gold Card: if the program detects over 1 megabyte of memory, it assumes you have Gold Card and the battery-backed clock, and that the date must be correct, and it goes straight to the report stage without asking for confirmation. However if you are running Rmp2 as part of a multitasking environment, say with Taskmaster or Qpac 2, you may have less than 1M of memory free even with a Gold Card and the program will ask you to confirm the date. With or without the Gold Card your best bet is to sdate before running.

The program then asks you if you want the report sorted chronologically. The sort is slightly slower but the overall speed makes any differences negligible, especially with the Gold Card. The events are then listed on screen. If you chose to sort, the events you may have missed in the last seven days are listed first in red, followed by forthcoming events in black. A nice touch is that you get the report in the form of x days ago and within x days. Very useful for busy users.

Printout

At this stage you are invited to have a printout of the day's reminders. On my Star LC10

printer I couldn't quite get each item on a single line unless I set condensed mode.

After this you can edit if required. You can print a hardcopy of your schedule in one of two formats. Option 1 is a printout of all 108 events in three columns with the event descriptions truncated to about 10 characters. Blank events are included also. Option 2 allows you to print out the events in a single line per event, untruncated form but does not print out the blank ones. Use the first one when you do your original editing and the second one when you're up and running.

The program can be used in two basic ways. The first is to run it on its own, in which case it will boot up your next application as soon as you have your report and done any editing. This way you've got your reminders or action points at the start of the day. These are the first tasks of the day to work on. Or you can use it multitasking so you can call it up as required during a session.

While the author is publishing and selling Rmp2 himself, I believe the previous versions are still available from Dilwyn Jones Computing. Many people will already have the previous versions, so Joe is making upgrades available (see Information).

Upgrades

There are four major improvements on previous versions and these are worthwhile. The schedule now allows 108 events instead of 54. Event descriptions can now be 40 instead of 30 characters

long. Remind_me_plus also allowed 40 characters, but the report truncated this to 30. Rmp2 gives the full 40 on display. Fourthly and perhaps most importantly the report is now on screen display and hardcopy in the more meaningful chronologically ordered format.

If you are upgrading from Remind_me_plus then your existing events schedule file can be used with the new program. However if you are upgrading from Remind_me you will have to create a modified version. The author includes a utility to carry out the operation, quickly and easily, following the on-screen prompts.

As usual, do not run your program from your master. Make a working copy either with WCOPY or the supplied cloning utility. This only copies the files you need to run the program, and not the additional utilities, so use WCOPY if you want all the files. If you wish to make a configured working copy onto another medium, say mdv instead of flp, then the cloning routine is best. The

routine insists on formatting the new medium, so if you are using preformatted disks or cartridges and want to save a couple of minutes, you can delete lines 155 and 160 from the cloning routine prior to running it.

Error trapping

I liked the ease of use of the program and think it will prove very useful. The manual is concise, and all the options and keypresses are constantly on screen both in the main program and its cloning and

converting routines. Error-trapping is very good. If for some reason it cannot find the events schedule file it will not lock you out, but invite you to place the disk with the file on it into the appropriate drive and try again. To save you as much typing as possible the program presents various previously used defaults at print and edit times. This saves you having to specify baud rate, printer port, month, year etc on every occasion. The program will only suggest saving the events schedule if you have made any changes. When you do a 'save'

you are given the option to have a backup copy. This is a useful provision, and allows you to put a backup disk or tape in the drive for increased security. The save or backup simply overwrites any previous events schedule file that it finds on the device.

One of the author's major objectives was speed and this has certainly been achieved. Loading and reporting are very fast even when running from microdrives, and there is not much of a penalty when requesting an ordered report. Once it's done its job it will run

REMINDERS ON Sun. 04 Apr 1993:-

Test to see if it works.....	6 DAYS AGO	29/3/1993	No.53
MOT EXPIRES.....	3 DAYS AGO	1/4/EACH YEAR	No.2
HOUSEKEEPING DUE.....	3 DAYS AGO	1/6/EACH MONTH	No.18
CAR INSURANCE.....	1 DAY AGO	3/4/EACH YEAR	No.6
PAY CLUB FEES.....	WITHIN 6 DAYS	10/4/EACH YEAR	No.3
SEASON TICKET.....	WITHIN 10 DAYS	14/0/EACH MONTH	No.17
PAY RAC.....	WITHIN 12 DAYS	16/4/EACH YEAR	No.4
TV LICENCE.....	WITHIN 26 DAYS	30/4/EACH YEAR	No.1
PAY QUANTA FEE.....	WITHIN 26 DAYS	30/4/EACH YEAR	No.5

SCHEDULE OF EVENTS

1.TV LICENCE	1000/11/30
2.MOT EXPIRES	1000/14/1
3.PAY CLUB FEES	1000/6/10
4.PAY RAC	1000/7/16
5.PAY QUANTA FEE	1000/12/31
6.CAR INSURANCE	1000/1/1
7.PASSPORT EXPIRES	1998/10/29
8.HOUSE INSURANCE	1000/11/1
9.CONTENT INSURANCE	1000/7/15
10.FREEZER INSURANCE	1000/3/20
11.HEALTH INSURANCE	1000/12/30
17.SEASON TICKET	1000/0/14
18.HOUSEKEEPING DUE	1000/0/1
19.QUANTA AGM	1991/11/24
20.ALL FORMAT SHOW	1991/6/22
21.VISIT FRANK & HELEN	1992/5/6
22.START HOLIDAY	1991/7/8
37.OUR ANNIVERSARY	1000/6/10
38.JOHN'S BIRTHDAY	1000/7/3
39.SUE'S BIRTHDAY	1000/6/5
50.PAY MORTGAGE	1000/6/30
53.Test to see if it works	1993/3/29
54.Stephanie's Birthday	1000/12/14

printout
examples

your next program for you without messing around. In fact, sometimes it's over so quickly you want to run it again to make sure you didn't miss anything. No problem. Just leave it in the drive and it will reboot in no time.

I thoroughly recommend Remind_me_plus2 for QL'ers wanting an easy time and date management system on their favourite computer.

REMIND- Me-Plus 2

INFORMATION

Program: Remind_Me_Plus2

Publisher: J Haftke, 7 Lansdowne Road, Sidcup, Kent DA14 4EF. Tel. 081 302 6154.

Price: £20; Upgrade from Remind_Me £10; Upgrade from Remind_Me_Plus £5.

System: Minerva and Gold Card compatible. Runs on basic QL with microdrives.

VERY BASIC SUPERBASIC

Dilwyn Jones introduces procedures and functions.

This month we'll be learning about procedures and functions. Despite the rather off-putting terms, I hope you will find them useful and easy parts of the QL SuperBasic language.

We studied subroutines in the last issue and found that writing blocks of code as routines which could be called more than once by different parts of the program was useful and convenient. We saved a lot of repetition by doing this, but the snag was that we had to refer to each routine by its line number, which was a bit of a pain, especially in long programs, where we would have to remember where each routine was. After all, humans prefer to think in words and names rather than in computer-style numbers.

Routine names

The QL has a method for giving such routines names. And not just simple, obscure single-character names, but long, meaningful names which describe what the routine does. You can choose quite reasonable names for these routines, as long as they don't clash with

a name which the QL already knows, such as PRINT or LET.

Figure one shows a short example procedure, which simply clears all three windows (or boxes) on the screen with three CLS statements. A procedure is defined by giving it a name and marking the start and end of the routine. It is started simply by using its name elsewhere in the program. It finishes either when it reaches the end of the routine, or when it executes a RETURN statement (which tells it to end early).

The start is marked with a DEFINE PROCEDURE statement followed by the name (in this case CLEAR_ALL_WINDOWS). There must be at least one space between DEFINE and PROCEDURE, and another space between PROCEDURE and the name. The hash symbols after the CLS statements simply refer to which of the boxes on the screen to clear. #0 is the box at the bottom (normally black, where you type the commands), #1 is the red box, while #2 is the part in which programs are listed, coloured white when the QL is in monitor mode, or blue in television mode.

Figure 1

Example procedure to clear all windows on the screen.

```
1000 DEFINE PROCEDURE CLEAR_ALL_WINDOWS
1010 CLS #0 : CLS #1 : CLS #2
1020 END DEFINE CLEAR_ALL_WINDOWS
```

Clear names

The end point is marked with the END DEFINE statement. Note that in this case it also has the name CLEAR_ALL_WINDOWS after it. This is not essential, the QL will not mind if you just type it as END DEFINE or as END DEFINE CLEAR_ALL_WINDOWS. It is a little clearer for you the programmer and anyone else who reads it if you do include the name, especially in longer examples.

Note that when typed into the QL, the names DEFINE and PROCEDURE come out in mixed case, that is, some letters are in upper case, while others are in lower case. You have to type those in upper case, but once you have typed those, the QL knows what you mean and inserts the extra lower case letters for you, so you just have to type in DEF PROC, for example, or END DEF and the QL will insert the full names for you. This saves you a little bit of typing.

Having typed in this little routine, all we have to do to clear all the boxes on the screen is to use the command CLEAR_ALL_WINDOWS, like this:

```
100 CLEAR_ALL_WINDOWS
```

In this example, we do not save much by using procedures, but if the routine is called several times in a program it does save having to type in sev-

eral copies of the same commands.

Like a command

Have you noticed that the procedure is called exactly as if it were a new QL command? In a way, it is. By writing programs as procedures, we are in a way extending the computer's vocabulary by teaching it new routines, which we can call by name.

Another good reason for using procedures, quite apart from avoiding repetition, is to split large programs up into smaller, meaningful sections. This simplifies writing large programs, because you can then write and test parts of it at a time.

Figure two shows another example using procedures. This time, we create a routine to roll a dice for use in games. It uses many commands we have already learned about in this series, and it will be developed into examples of more complex use of procedures. The end result of this routine is a word printed on screen - the number one, or two, etc.

Another way in which this routine could be written is as a FUNCTION. Now this complex-sounding term simply means that the routine passes a value back to the calling part of the program, rather than just simply finishing and that's that. The routine works out a value, which it RETURNS (hence the use of the RETURN keyword to pass the

Figure 2 - Dice routine

```
1000 DEFine PROCedure ROLL_DICE
1010 LET random_number = RND(1 TO 6)
1020 SElect ON random_number
1030 =1 : PRINT'One'
1040 =2 : PRINT'Two'
1050 =3 : PRINT'Three'
1060 =4 : PRINT'Four'
1070 =5 : PRINT'Five'
1080 =6 : PRINT'Six'
1090 END SElect
1100 END DEFine ROLL_DICE
```

value back). A couple of examples will explain more than a thousand words in this case. **Figure three** shows the dice routine adapted in such a way that it no longer prints the words, but simply derives a random number to represent the dice and give it back to the part of the program which asked for it. So the routine could be called by different parts of the program and use the number in different

which ends with the dollar symbol, or an integer (whole number only) function by using a name which ends with the percentage symbol. See **Figures four** and **five**. The string function returns the value of the dice as text, One, Two, three, etc. and could be called with a command such as LET a\$ = DICES\$ or PRINT DICES\$.

Note the case of the letters of the word function. You can also

Figure 5 - String function

```
1000 DEFine FuNction DICES$
1010 LET random_number = RND(1 TO 6)
1020 SElect ON random_number
1030 =1 : value$ = 'One'
1040 =2 : value$ = 'Two'
1050 =3 : value$ = 'Three'
1060 =4 : value$ = 'Four'
1070 =5 : value$ = 'Five'
1080 =6 : value$ = 'Six'
1090 END SElect
1100 RETurn value$
1110 END DEFine DICES$
```

and functions is to use mixed case names, where names start with an upper case letter and are in lower case for the rest of the name, eg DEFine PROCedure Roll_Dice. Which method you use is up to you. I always tend to use lower case names for variables and upper case for procedure and function names. Some people prefer to use mixed case names for procedures and functions.

also used by another part of the program and this routine destroys a value set in another part of the program. Oops!

We can specify that a variable used in a procedure or function is "local" to that routine. In other words, it is created temporarily for that routine and it "disappears" after the routine has finished. So in this way, you could have two variables called "random_number" to help prevent the problem just mentioned. So when the function is called, it creates a "temporary" variable called random_number even if one of the same name already exists. When the function has finished, it is deleted again and the old version of the variable is restored. This can be useful in large programs, but in shorter programs it tends to complicate matters more than is usually necessary if there is no use of duplicate names. The LOCAL statement is followed by a list of the names to be treated as local only to that routine, all separated by commas. In theory, you can have as many as you want, in practice, many versions of the QL ROM limit you to about nine local variables. Users lucky enough to have a Minerva system installed on their QL are luckier, the same limits do not apply to them.

Figure 3 - Dice routine written as a function

```
1000 DEFine FuNction DICE_VALUE
1010 LET random_number = RND(1 to 6)
1020 RETurn random_number
1030 END DEFine DICE_VALUE
```

ways. Call this function with a command such as LET r = DICE_VALUE or PRINT DICE_VALUE. The number returned is just like any other QL number and can be stored in a variable or printed, for example.

Types of names

This example was 'floating point' type. You could also write string functions by using a name

enter just the capital letters, or DEF FN if you wish. Many computers use functions, but on most they are abbreviated to FN, the QL uses the full name which is slightly clearer. I have used upper case names for the functions and procedures. There is no real reason to do this, except to avoid mixing the names up with ordinary variables when looking at a program. The QL uses the case in which you first entered that name, so if you entered it in lower case, it is always used in lower case in a program even if you later type it in upper case. Upper case names tend to get mixed up with names of other commands, but normally there is no confusion as long as you know the names of all the commands the computer understands!

Another option for procedures

New tricks

There are several other tricks which can be used in procedures and functions. The first we'll look at is "local variables" (**Figure six**).

You may have noticed that some of the routines use variable names inside the routines. If the procedure or function is called from several parts of a program, there is a risk that you may be using the same variable name in another part of the program, especially if the name is a common, meaningful one! Such use might cause the dreaded bugs to appear, where a program behaves unpredictably for reasons which are hard to understand. It only becomes obvious when you realise that the variable random_number is

Figure 4 - Integer function

```
1000 DEFine FuNction DICE%
1010 LET rand_no% = RND(1 TO 6)
1020 RETurn rand_no%
1030 END DEFine DICE%
```

Figure 6 - Local variables

```
1000 DEFine FuNction DICE_VALUE
1010 LOCAL random_number
1020 LET random_number = RND(1 TO 6)
1030 RETurn random_number
1040 END DEFine DICE_VALUE
```


Figure 7 - Parameters

```
1000 DEFine FuNction WHOLE_NUMBER (value)
1010   LOCAL added
1020   LET added = value + 0.5
1030   RETurn INT(added)
1040 END DEFine WHOLE_NUMBER
```

"Parameters"

The next trick we can add to these routines is to use "parameters". The bad news is that the terms get even longer and sound more difficult, the good news is that parameters are very useful and powerful facilities.

A parameter is a value which is placed after the name of the procedure or function, in order to pass a value to the routine without having to set variables all over the place. There can be no, one, two or more parameters, depending on what you want to accomplish. As examples of parameters (this is not quite the same, but sufficiently similar for our purposes), consider the PRINT command. You can put variables or strings or numbers after the PRINT command in a list, such as PRINT a,1,'Hello'. You can put such a list after the procedure or function names. In the definition line, the parameters are referred to as 'formal parameters' and the list in the calling routine as 'actual parameters' (I did warn you about complex terms!).

The 'formal parameter' list is a list of variable names in the definition line, usually separated by commas, though other symbols can be used too, all enclosed in brackets. The procedure or function can use look at the values of these in the same way as normal variables, and usually set them as well (though not always). The calling line places the real variables in the corresponding positions and so it is possible, without rewriting a rou-

tine, to call it using different variable names in the list, which is often very useful and versatile.

Brackets or not

When the routine is called, values are inserted for each parameter. When a function is called, all such values must be in brackets, while with a procedure, the actual parameters can be used without brackets. If you put a bracket around one of the procedure parameters when called, it turns that one into an expression, which means that the procedure could not change the value of that variable. This is where life gets complicated, we get into the meanings of terms such as "reference parameters" (which effectively means that the procedure can change the value of that variable when passed) and "pass by value parameters" (the procedure cannot change that value).

Figure seven shows a useful example. This is a function to round off a decimal number to a whole number. SuperBasic already has a built-in function to round a number down to a whole number, INT. This is used in the routine, but can be used on its own like this: LET a = INT(2.5)

Here, we supply INT with an "actual parameter" of 2.5 (it could have been a variable). INT looks at the value passed to it and chops off the digits after the decimal point, then returns the result 2 to be placed in the variable a.

This is all well and good, but sometimes we need to round off a number to the nearest whole

Figure 9 - Multiple parameters

```
100 PRINT TOTAL OF (2,4,6)
110 ADD 1,2,3 : PRINT g
120 :
1000 DEFine FuNction TOTAL_OF (a,b,c)
1010   RETurn a+b+c
1020 END DEFine TOTAL_OF
1030 :
1040 DEFine PROCedure ADD (d,e,f)
1050   LET g = d+e+f
1060 END DEFine ADD
```

number. Simply chopping off the digits after the decimal point is not enough, since a value such as 3.9 would obviously produce the wrong result of 3, whereas it should produce 4. But by adding 0.5 before chopping off the digits after the decimal point, we can ensure that the function returns the result we want, namely rounding off to the nearest whole number, not just down to the nearest whole number. The result is first placed in a variable called "added", which holds the value passed to the routine via the formal parameter "value" with 0.5 added, then INT chops off the digits after decimal point before returning the rounded value to the calling routine. This example can be called with lines such as PRINT WHOLE_NUMBER(3.9) or LET x = WHOLE_NUMBER(y).

Negative numbers

Would that example routine behave as you expected it to with negative numbers? In other words, would you expect it to turn -1.5 into -1 or -2? Try to modify it to produce the result you expect (I'm not saying that one or other is mathematically correct, it is a good exercise to make you think about a tricky question like that).

As a useful demonstration of parameters, that routine can be rewritten as a procedure (see Figure eight). Here, the routine changes the value of a variable parameter instead of returning a function value. Are you confused yet? The routine is now called with an expression such as: LET x = 2.5 : WHOLE_NUMBER x which would change the value

of x to 3. Got it?

But if the expression was written like this:

```
LET x = 2.5 : WHOLE_NUMBER (x)
```

the procedure would be unable to change the value of x since the brackets have turned it into an expression and the value of an expression cannot be set. As an example, think of (x) as x+0. You cannot say in SuperBasic LET x+0 = 2.5.

More than one

To clarify what you must do when more than one parameter is used, Figure nine shows a procedure and function with more than one parameter. Notice where the brackets go around the parameters of the function call, while the procedure call has no brackets around the parameters. Both routines add up three values, the function returns the value in the normal way, while the procedure puts the result in a variable which is later printed by the PRINT command.

I hope you have now learned that while procedures and functions can be difficult to master at first, they are very flexible and useful tools for the program writer and used properly, can save a lot of time both in typing and convenience terms. Properly used, they make programs easier to read and write as long as you take care to break a program down into logically sized chunks. Do take the time and effort to try to master procedures, functions, parameters and local variables, you are missing out on a great SuperBasic facility if you don't!

Figure 8 - Procedures changing parameter values

```
1000 DEFine PROCedure WHOLE_NUMBER (value)
1010   LET value = INT(value + 0.5)
1020 END DEFine WHOLE_NUMBER
```


BEGINNER'S MACHINE CODE

In part 5, Alan Bridewell tackles hexadecimal, binary and logic.

In the first part of this series, I mentioned that computers, which are electrical devices, treat high voltages as the number 1 and low voltages as the number 0. By putting these ones and zeros together we can make any number we wish.

We usually work with decimal numbers in everyday life, and computers tend to reflect this. Certainly SuperBasic does. In assemblers we tend to work in hexadecimal numbers. Neither of these is the true number system of a computer. With only two voltages to represent the numbers one and zero, the computer has to work in binary numbers. This is a very easy number system to understand, and it follows the same rules as both the decimal and hexadecimal systems, but with only two numbers, 1 and 0. To represent bigger numbers, a second binary digit will show two, a third will show four, a fourth will show eight, etc.

Bytes and bits

A computer's memory is organised in 'bytes' which consist of eight such binary digits, or 'bits'. The biggest number that can be stored in a byte is when all the bits contain a high voltage to give the number 1: ie 11111111. To see what that number is in decimal we must take into account the weighting of each bit. So, starting from the least significant bit on the right, we get

$$1+2+4+8+16+32+64+128 = 255$$

which shows why the biggest number a byte can store is 255.

By a similar process, you could easily show that a word (two bytes, 16 bits) can store numbers up to 65535, and long words (four bytes, 32 bits) can store numbers up to 4,294,967,295.

When it comes to normal arithmetical processes (add, subtract, multiply and divide), it makes no difference which number system you use for the calculation. You will get the same result. So, for example, the number 15 in decimal is the same as F in hexadecimal, and 1111 in binary. If we double this number, we get

$$\begin{array}{l} \text{in decimal } 15 + 15 = 30 \\ \text{in hexadecimal } F + F = 1E \\ \text{in binary } 1111 + 1111 = 11110 \end{array}$$

You can convert the numbers yourself if you need convincing that 30 in decimal, 1E in hexadecimal and 11110 in binary are all the same number.

Hexadecimal

SuperBasic programmers use decimal numbers almost exclusively because the language is set up to use it, and it is the most familiar to us. Assembler programmers tend to use hexadecimal because it makes bytes, words and long words easy to deal with, and takes a lot less time and space than binary. You might be wondering at this stage why we need to bother with binary, since we can work in whatever number system suits our needs.

As long as we are treating our data simply as numbers, and are using only add, subtract, multiply or divide, then this is

indeed true. But we often use our data in other ways, where the state of each bit is the important fact, not the overall number they represent. I can illustrate this with a few simple examples.

First, when we send data to the screen ram to produce effects on the screen, it is the state of the individual bits which determines which pixels light up with which colours. Later we shall look at this in some detail. Second, when we send graphics data to a printer, it is the state of the individual bits which determine which pins fire to produce the dots on the paper. Third, when we use a computer to control such things as robots or sound generators, it is the state of the individual bits which determines which circuit is activated to produce the effects required.

Clearly, there are many situations where it is necessary for the programmer to be aware of what is happening to the individual bits, rather than the number they represent. This does not mean that in these situations we can forget about the number they represent, because we can't. The reason for this is when we send the data, or when we receive the data, we do so as a number.

No sense!

To help us deal with bits rather than numbers, there are some important instructions which will make absolutely no sense at all if we treat our data purely as numbers. But they make perfect sense if we treat the data as groups of binary digits. These instructions include

something called the "bit manipulation instructions", the "shift" and "rotate" instructions, and finally the "logical" instructions. We shall deal here with the "logical" instructions, because they are the easiest to understand, and the most likely to be useful to someone just starting out on assembler programming. If, like me, you came to computing via a hobby in electronics, you will recognise these instructions as doing the same thing as the logic chips in the 7400 series TTL chips and the 4000 series Cmos chips.

The first of these instructions is 'NOT', which simply converts each bit into the state it was 'not' in before. If it was zero, it becomes one, and if it was one, it becomes zero. For example, take the line

NOT.W D3

Suppose register D3 contains the word 1100110011001100 in binary. (We could have used NOT.B or NOT.L for either byte or long word sized data if we wished.) Then this line will cause the contents of D3 to change to 0011001100110011. In binary, it's obvious what is happening. But in hex or, even worse, in decimal, there seems to be no connection at all between the number we start with and the one we end up with.

Bit by bit

The next instruction is 'AND'. This instruction compares two numbers bit by bit. If the same bit in both numbers is one, then the result is one, otherwise the result is zero. In other words, we only get one if the bit in the first

number AND the bit in the second number are both one. For example, take the line

```
AND.W D2,D3
```

This will take the word in register D2 and do an AND comparison with the word in register D3, leaving the result of this comparison in D3. Suppose D2 contains 10101010101010 and D3 contains 1111111100000000 at the start. Then doing the bit by bit comparison, we get

```
D2      at      the      start
10101010101010
D3      at      the      start
1111111100000000
D3      at      the      end
1010101000000000
```

The third logical instruction is 'OR'. When this compares two numbers bit by bit, the result is one if either of the bits is one, otherwise it gives zero. So, if we take the line

```
OR.W D2,D3
```

and give D2 and D3 the same numbers as before, we get

```
D2      at      the      start
10101010101010
D3      at      the      start
1111111100000000
D3      at      the      end
1111111110101010
```

The final logical instruction is 'EOR', which stands for 'exclusive OR'. When this compares two numbers bit by bit the result is one if one or the other bit is one, but is zero if both are one, or if neither is one. In other words, it's one if one or the other is one, but not both. So, taking the line

```
EOR.W D2,D3
```

and giving D2 and D3 the same numbers as before, we get

```
D2      at      the      start
10101010101010
D3      at      the      start
1111111100000000
D3      at      the      end
0101010110101010
```

If all this is rather confusing, you will find that these instructions are available from SuperBasic directly, and it may be instructive to play with them in SuperBasic first to see what they do. If you look in the **QL User Guide** in the **Concepts** section, under the heading **Operators**, you will find the operators '&&' which is the bitwise 'AND', '||' (two sticks) which is the bitwise 'OR', '^ ^' (two hats) which is the bitwise 'EOR' (called 'XOR' in the User Guide), and finally '~' (tilde) which is the bitwise 'NOT'. (Beware: The SuperBasic operators OR, AND, XOR and NOT simply treat the entire number as either zero or non-zero. They do not consider the value of individual bits, and so they are entirely different in their action.)

If you try typing in SuperBasic lines like

```
PRINT ~ 25 PRINT 120 &&
63 PRINT 25000 || 73 PRINT
1234 ^ ^ 739
....etc
[tilde, two ampersands, two sticks, two hats]
```

and see what numbers get printed to the screen, you will find out for yourself how these operators work. There are a couple of limitations that must be noted, though. Firstly, the SuperBasic only works with integers, so that the numbers are limited to the range -32768 to 32767. Also, if you use negative numbers, or get negative numbers as a result, you will need to understand how 'signed numbers' work, and this I shall leave until another time.

Demonstration

Continuing with the practice of demonstrating all commands with screen effects, **Listing one** is a demonstration of the effect of these logical operations on the screen ram. The listing actually contains three routines.

The first routine shows the blobs on the screen when numbers are poked into the screen ram, then shows how the application of these logical operators alters the blobs. As indicated in the initial comments, registers D1 and D2 are expected to

contain words for the routine to use. These will be input as parameters in the CALL from SuperBasic. D3 will contain the results of the logical operations. The routine is very simple and repetitive, and if you have followed this series up to now, you will have no problems with it. At various locations down the screen, we display the result of putting into screen ram, in order, the two words, the two words after the 'NOT' instruction, and the results of comparing the two words with the 'AND', the 'OR' and, finally, the 'EOR' instruction. As before, we end up by putting zero in register D0 to make sure we get no error message, and then return to SuperBasic. I will not go through this part in detail, because I think the comments in the listing are explanation enough.

More effects

The first routine demonstrates what the instructions do, but does not give any real indication of the kind of effects that can be achieved. The other two routines are designed to give a taste of this. The second routine copies the screen ram to some other area of ram, called BUFFER. is almost the same as part of the listing in part three of this series.

First we make register D0 into a loop counter by moving \$7FFF, which is one less than the screen ram size, into it. It has to be one less because the DBRA instruction stops looping when the decrementing results in a negative value, not when it results in zero.

(In parts two and three of this series I made the mistake of making the loop counter \$8000 which is equal to the ram size. This meant that the program looped one extra time, which might have caused a crash, but, thankfully, it didn't. I am indebted to Norman Dunbar for pointing this out.)

Next, we make register A0 contain the first address of the screen ram, and register A1 contain the first address of the BUFFER. The loop consists of post-incrementing both the source address and the destination address as we transfer

each byte of the screen ram to the buffer. We end up, as always, by putting zero in register D0 to ensure no error messages occur before returning to SuperBasic.

EOR in effect

The third routine is very similar in that it returns the contents of the buffer back to the screen ram. However, instead of simply copying the bytes it uses the EOR operation to combine the buffer byte with the current screen byte. It does this as follows. First, register D0 is set up as the loop counter, with A1 holding the screen address, and A0 the buffer address. The contents of the address in A0 are moved to register D1, after which A0 is incremented. Then the contents of D1 are EORed with the contents of the address in A1, after which A1 is incremented.

Listing two is a SuperBasic routine to load and run the machine code. Note that the RESPR command allocates enough memory for both the machine code and the buffer, which must be 32K long (the same as the screen ram). After loading the machine code, it asks for two numbers to be input, after which it CALLs the machine code. In order to make sense of what is on the screen, it also PRINTs on the screen next to each blob what produced it. It is set up as an endless loop, so that you can keep trying numbers until you are sick of the sight of it! Pressing Esc will move you on to the next part of the program. Although the CALL command will accept any sized numbers and put sensible parameters into the registers, the SuperBasic bitwise operators will only accept word integers, and, of course, the machine code is written to accept only these. However, the logical operators have long word versions as well if you require them.

After pressing Esc to leave the first part of the program, it will draw a pattern of circles on the screen, and then store this in the buffer. Pressing any key (except Esc) will then clear the

LISTING 1

ALTERING THE DISPLAY WITH BINARY LOGIC

D1 WILL CONTAIN THE FIRST WORD
D2 WILL CONTAIN THE SECOND WORD
D3 WILL CONTAIN THE RESULTS OF LOGICAL OPERATIONS

```
MOVEA.L #S2000,A0 ; SCREEN ADDRESS IN A0
MOVE.W D1,A0 ; POKE 1ST WORD TO SCREEN
MOVEA.L #S2100,A0 ; NEW SCREEN ADDRESS IN A0
MOVE.W D2,A0 ; POKE 2ND WORD TO SCREEN
MOVE.W D1,D3 ; 1ST WORD TO D3
NOT.W D3 ; NOT 1ST WORD TO D3
MOVEA.L #S2200,A0 ; NEW SCREEN ADDRESS IN A0
MOVE.W D3,A0 ; POKE 'NOT' 1ST WORD TO SCREEN
MOVE.W D2,D3 ; 2ND WORD TO D3
NOT.W D3 ; NOT 2ND WORD TO D3
MOVEA.L #S22F00,A0 ; NEW SCREEN ADDRESS IN A0
MOVE.W D3,A0 ; POKE 'NOT' 2ND WORD TO SCREEN
MOVE.W D1,D3 ; 1ST WORD IN D3
AND.W D2,D3 ; 1ST WORD 'AND' 2ND WORD IN D3
MOVEA.L #S23E00,A0 ; NEW SCREEN ADDRESS IN A0
MOVE.W D3,A0 ; POKE 1ST 'AND' 2ND TO SCREEN
MOVE.W D1,D3 ; 1ST WORD IN D3
OR.W D2,D3 ; 1ST WORD 'OR' 2ND WORD IN D3
MOVEA.L #S24D00,A0 ; NEW SCREEN ADDRESS IN A0
MOVE.W D3,A0 ; POKE 1ST 'OR' 2ND TO SCREEN
MOVE.W D1,D3 ; 1ST WORD IN D3
EOR.W D2,D3 ; 1ST WORD 'EOR' 2ND WORD IN D3
MOVEA.L #S25C00,A0 ; NEW SCREEN ADDRESS IN A0
MOVE.W D3,A0 ; POKE 1ST 'EOR' 2ND TO SCREEN
MOVEQ #S00,D0 ; NO ERROR MESSAGE
RTS ; RETURN TO SUPERBASIC
```

SAVE THE SCREEN

SAVE SCREEN TO BUFFER

```
MOVE.W #S7FFF,D0 ; LOOP COUNTER
MOVEA.L #S20000,A0 ; SCREEN ADDRESS IN A0
LEA.L BUFFER,A1 ; BUFFER ADDRESS IN A1
; TO (A1), THEN
; INCREMENT BOTH
DBRA D0,LOOP ; IF D0 > 0, THEN DECREMENT D0 AND
; BRANCH TO 'LOOP'
; IF D0 < 0, THEN LEAVE THE LOOP
; AND CONTINUE THE PROGRAM
MOVEQ #S0,D0 ; NO ERROR RETURN
RTS
```

FOR SAVED SCREEN WITH CURRENT SCREEN

FOR SCREEN

```
MOVE.W #S7FFF,D0 ; LOOP COUNTER
MOVEA.L #S20000,A1 ; SCREEN ADDRESS IN A1
LEA.L BUFFER,A0 ; BUFFER ADDRESS IN A0
; TO D1, THEN
; INCREMENT A0
EOR.B D1,(A1)+ ; EOR CONTENTS OF(A1)
; WITH D1, THEN
; INCREMENT A1
DBRA D0,LOOP2 ; IF D0 > 0, THEN DECREMENT D0 AND
; BRANCH TO 'LOOP'
; IF D0 < 0, THEN LEAVE THE LOOP
; AND CONTINUE THE PROGRAM
MOVEQ #S0,D0 ; NO ERROR RETURN
RTS
```

LISTING 2

```
100 Z=RESPR(33280)
110 LBYTES fip1_Listing1_code,z
120 OPEN#3,con_512x256a0x0
130 REPEAT loop
140 REPEAT wordsin
150 CLS#3
160 INPUT#3, "1st WORD? (-32768 to 32767) ",word1
170 INPUT#3, "2nd WORD? (-32768 to 32767) ",word2
180 IF word1 > -32768 AND word1 < 32767
190 IF word2 > -32768 AND word2 < 32767 THEN EXIT wordsin
200 END IF
210 END REPEAT wordsin
220 CLS#3
230 CALL z,word1,word2
240 AT#3,0.5:PRINT#3,word1
250 AT#3,3.5:PRINT#3,word2
260 AT#3,6.5:PRINT#3,"NOT ",word1," = ","word1
270 AT#3,9.5:PRINT#3,"NOT ",word2," = ","word2
280 AT#3,12.5:PRINT#3,word1," AND ",word2," = ",word1&word2
290 AT#3,15.5:PRINT#3,word1," OR ",word2," = ",word1|word2
300 AT#3,18.5:PRINT#3,word1," EOR ",word2," = ",word1^word2
310 END IF
320 END IF
330 PAUSE -1
340 IF KEYROW(1)=8 THEN EXIT loop
350 END REPEAT loop
360 CLS#3
370 FOR n = 1E-2 TO 1 STEP 1E-2
380 CIRCLE#3,100*SIN(n),100*COS(n),100*n
390 END FOR n
400 sstore
410 PRINT#3, "This screen has been stored"
420 PRINT#3, "Now press a key to clear the screen"
430 PAUSE -1
440 REPEAT loop2
450 PAPER#3,RND(255)
460 CLS#3
470 STRIP#3,0
480 PRINT#3, "Now press a key to EOR with current screen"
490 PAUSE -1
500 IF KEYROW(1)=8 THEN EXIT loop2
510 srestore
520 PAUSE -1
530 IF KEYROW(1)=8 THEN EXIT loop2
540 END REPEAT loop2
550 CLOSE#3
560 DEFINE PROCEDURE sstore
570 CALL z + 80
580 END DEFINE s
590 DEFINE PROCEDURE srestore
600 CALL z + 104
610 PRINT#3,"Press any key to continue"
620 END DEFINE
```


screen with a random paper colour. A further key press will EOR the stored pattern with the screen colour. This process can be repeated as often as you wish, and Esc will leave the program.

Listing three is the machine code in Marcus and Simon's Hex Loader, for those who do not have an assembler.

Once you have got the hang of these instructions, there are a lot of interesting experiments to do. Here are a few suggestions.

For a start, you could alter Listing two so that the pattern

has circles of different colours, and you could see the effect of EORing different colours with each other. You could next alter the EOR.B instruction in LOOP2 of **Listing one** to OR.B and then AND.B to see the effect of these. They are usually not as interesting as EOR (for reasons which should not be difficult to work out if you have understood this article) and often result in a blank screen. But they sometimes give interesting results.

Quite an interesting effect is produced by writing a routine which will apply the NOT opera-

tion to the entire screen using a DBRA loop.

Black screen!

If you EOR the screen with an identical copy of itself, it makes the screen go black! A second EOR will bring the picture back again. A little thought will show you that this must be so. The only thing you need to know (apart from what EOR means) is that a black screen means the whole screen ram is filled with zeros.

Finally, if you have some saved pictures (especially digitised

video images) which you can LBYTES to the screen, you can produce really startling effects by using these operators to combine two or more pictures. Again, this works best with EOR, but quite useful results can sometimes be obtained with AND and OR.

Of course, these instructions do have other, more serious programming applications, but playing around with the screen display is undoubtedly a very enjoyable way of becoming familiar with them.

Happy coding!

LISTING 3

```

100 REMark Sinclair QL World HEX LOADER v 3
110 REMark by Marcus Jeffery & Simon N Goodwin
120 :
130 CLS: RESTORE :READ space:start=RESPR(space)
140 PRINT "Loading Hex...":HEX_LOAD start
150 INPUT "Save to file...":fs
160 SBYTES fs,start,byte:STOP
170 :
180 DEFine FUNCTION DECIMAL(x)
190 RETURN CODE(16*(x)-48-7*(h$(x)>"9"))
200 END DEFine DECIMAL
210 :
220 DEFine PROCEDURE HEX_LOAD(start)
230 byte=0:checksum=0
240 REPeat load_hex_digits
250 READ h$
260 IF h$="" :EXIT load_hex_digits
270 IF LEN(h$) MOD 2
280 PRINT "Odd number of hex digits in: ",h$
290 STOP
300 END IF
310 FOR b=1 TO LEN(h$) STEP 2
320 hb=DECIMAL(h$(b)):lb=DECIMAL(h$(b+1))
330 IF hb<0 OR hb>15 OR lb<0 OR lb>15
340 PRINT "Illegal hex digit in: ",h$:STOP
350 END IF
360 POKE start+byte,16*hb+lb
370 checksum=checksum+16*hb+lb
380 byte=byte+1
390 END FOR b
400 END REPeat load_hex_digits
410 READ check
420 IF check<>checksum
430 PRINT "Checksum incorrect. Recheck data. ":STOP
440 END IF
450 PRINT "Checksum correct. Data entered at: ",start
460 END DEFine HEX_LOAD
470 :
480 REMark Space requirements for the machine code
490 DATA 128
500 :
510 DATA "207C00020200":REMark MOVEA.L $20200,A0
520 DATA "3081":REMark MOVE.W D1,(A0)
530 DATA "207C00021100":REMark MOVEA.L #21100,A0
540 DATA "3082":REMark MOVE.W D2,(A0)
550 DATA "3601":REMark MOVE.W D1,D3
560 DATA "4643":REMark NOT.W D3
570 DATA "207C00022000":REMark MOVEA.L #22000,A0
580 DATA "3083":REMark MOVE.W D3,(A0)
590 DATA "3602":REMark MOVE.W D2,D3

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600 DATA "4643":REMark NOT.W D3
610 DATA "207C00022F00":REMark MOVEA... #22F00,A0
620 DATA "3083":REMark MOVE.W D3,(A0)
630 DATA "3601":REMark MOVE.W D1,D3
640 DATA "C642":REMark AND.W D2,D3
650 DATA "207C00023E00":REMark MOVEA.L #23E00,A0

660 DATA "3083":REMark MOVE.W D3,(A0)
670 DATA "3601":REMark MOVE.W D1,D3
680 DATA "3642":REMark OR.W D2,D3
690 DATA "207C00024D00":REMark MOVEA.L #24D00,A0
700 DATA "3083":REMark MOVE.W D3,(A0)
710 DATA "3601":REMark MOVE.W D1,D3
720 DATA "B543":REMark EOR.W D2,D3
730 DATA "207C00025C00":REMark MOVEA.L #25C00,A0
740 DATA "3083":REMark MOVE.W D3,(A0)
750 DATA "7000":REMark MOVEQ #500,D0
760 DATA "4E75":REMark RTS
770 DATA "303C7FFF":REMark MOVE.W #7FFF,D0
780 DATA "207C00026000":REMark MOVEA.L #26000,A0
790 DATA "43FA0026":REMark LEA.L SUPER.A1
800 DATA "12D8":REMark LOOP MOVE.B (A0)+(A1)+
810 DATA "51C6FFFC":REMark DERA B0,LOOP
820 DATA "7000":REMark MOVEQ #500,D0
830 DATA "4E75":REMark RTS
840 DATA "303C7FFF":REMark MOVE.W #7FFF,D0
850 DATA "227C00020000":REMark MOVEA.L #22000,A1
860 DATA "41FA000E":REMark LEA.L BUFFER,A0
870 DATA "1218":REMark LOOP2 MOVE.B (A0)+,D1
880 DATA "B319":REMark EOR.B D1,(A1)+
890 DATA "51C6FFFA":REMark DBRA D0,LOOP2
900 DATA "7000":REMark MOVEQ #500,D0
910 DATA "4E75":REMark RTS
920 DATA ":",8994

```


a C L U S B s

AUSTRIA

DER Computer Club. Contact: Peter Postl, Stieberg 5, 1150 Wien, Austria.

BELGIUM

Club Sinclair BruQsl. Contact: Jaques Tasset, Aarlenstraat 104, 1040 Brussels, Belgium.

QL Club. Contact: Leon Thianche, Rue Paul Wemaere 12-14, 1150 Bruxelles, Belgium.

FRANCE

QL Contact France. Contact: Jean-Louis Dianoux, 38-40 Rue Stephenson, 75018 Paris, France.

GERMANY

Sinclair QL User Club eV. Contact: Franz Herrmann, Talstrasse 21, d-W5460 Ochenfels, West Germany. Magazine: Quasar.

GREECE

QL Athens Club. Contact: Stathis Grigoriadis, Tarsu 6-8, 10440 Athens, Greece.

HOLLAND

Sin_QL_Air. Contact: Secretary: Marco Holmer, J P Coenstraat, 3531 EN Utrecht, Netherlands. Magazine: Quasar. Editor: Same as Secretary. (Chairman: Cor Biemans, Elzenstraat 5, 5461 CL Vehgel, Netherlands.

ITALY

Qitaly Club. Contact: Roberto Orlandi, Via Brescia 26, 25039 Traveglianto (BS), Italy. Tel. +39 30 6863311. Magazine: Qitaly Magazine. Editor: Dr Eros Forenzi, Via Valeriana 44, 23010 Berbenno (SO), Italy. Tel. +39 342 492323.

NORWAY

Norwegian All Sinclair Association (NASA). Contact P Monstad, NASA, N-5580 Oelen, Norway. Magazine: Sinclair Magazine.

SCOTLAND

Scottish QL Users Group. Contact: Alan Pemberton, 65 Lingerwood Road, Newtongrange, Midlothian EH22 4QQ. Newsletter.

SPAIN

Qliper. Editor: Marcos Cruz, Acacias 44, (Monteclaro), E-28223, Pozuelo de Alarcon, Spain. Magazine: Qliper.

SWEDEN

International QL Conference bulletin board system (Swedish and English). Contact: Michael Cronsten, System Operator, Jamten-TCL, S Soere 1073, 83030 Lt, Sweden.

TURKEY

QL Qclub. Contact: Bulent Artuz, Prof. Sitesi B/1 D/5, Etiler 80600, Istanbul, Turkey.

UK

Quanta (UK): Membership Secretary, Bill Newell, 213 Manor Road, Benfleet, Essex SS7 4JD. Magazine: Quanta. Editor: Bill Fuggle, 20 Widnes Avenue, Selly Oak, Birmingham B29 6QE. Quanta.

Ashstead sub-group: Derek Stewart, 13 Beales Road, Great Bookham, Surrey KT23 4NA.

Bristol sub-group: Roy Brereton, 94 Teignmouth Road, Clevedon, Avon BS21 6DR.

East Anglia: Geraint Jones, 1 Bridgate Court, Thetford IP24 3AJ. (Also market Rom Switcher.)

Essex sub-group: Dave Walker, 22 Kempton's Mead, Potters Bar, Herts EM6 3HZ.

London sub-group: Jeremy Davis, 6 Elmcroft Crescent, Harrow, Middx HA2 6HN.

North-east: Derek Stewart, 20 Emily Street, Gateshead.

Northern Ireland: Billy Turkington, Fairyhill, Rostrevor, Newry, Co. Down, BT34 3BB.

Mid-Southern sub-group: Geoff Fish, 44 Billing Avenue, Wokingham, Berks RG11 4JE.

QL User Group (West Midlands): Mike Bedford-White, 16 Westfield Road, Acocks Green, Birmingham B27 7TL.

QL MUG (Merseyside): Peter Tyler, The Meads, Kingsley Road, Frodsham, Cheshire WA6 6BA. (Also market a mouse.)

Solent sub-group: Graham Evans, 32 Reeves Way, Lowford, Bursledon, Southampton. Tel. 0703 403350.

USA

New England Sinclair QL User Group. Contact: Sherm Waterman, PO Box 8763, Boston MA 02114, USA. Magazine: NESQLUG News. Editor: Peter Hale, 195 Central Ave., Chelsea, MA 02150, USA.



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